From: LIA03 Hoc
Sent: Friday, April 15, 2011 12:21 PM
To: LIA08 Hoc; LIA02 Hoc; LIA10 Hoc
Subject: FW: OUO -- 1200 EDT (April 15, 2011) USNRC Earthquake-Tsunami Update
Attachments: USNRC Earthquake-Tsunami Update.041511.1200EDT.pdf

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From: LIA07 Hoc
Sent: Friday, April 15, 2011 12:20 PM
To: LIA07 Hoc
Subject: OUO -- 1200 EDT (April 15, 2011) USNRC Earthquake-Tsunami Update

Attached, please find a 1200 EDT, April 15, 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 not intended to be shared outside of the Federal government without NRC approval.

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

Thank you,
Jim

Jim Anderson
US Nuclear Regulatory Commission
LIA07.HOC@nrc.gov (Operations Center)

GGGG/1

From: Borchardt, Bill
To: Doane, Margaret
Subject: Re: Two things
Date: Saturday, March 12, 2011 4:22:38 PM

Thanks for the correction. Call my cell if you have a chance.
Bill Borchardt
Via blackberry

----- Original Message -----
From: Doane, Margaret
To: Borchardt, Bill
Cc: Ramsey, Jack
Sent: Sat Mar 12 15:48:53 2011
Subject: Two things

1) Tony Ullstes is on a chartered flight, not military. He's with Fairfax and LA Disater teams.
2) We sent offers of assistance to both NISA and JNES. They have replied very kindly that at this time they are adequately staffed with expertise to address the issues. They appreciate the offer and knowing that we are there if they need anything.
Margie

Sent from an NRC Blackberry
Margaret Doane

GGGG/2

From: Borchardt, Bill
To: HOO Hoc
Subject: Fw: Update on Japan Situation
Date: Saturday, March 12, 2011 11:08:05 PM
Attachments: ANS Japan Backgrounder.pdf

Please print the backgrounder.
Bill Borchardt
Via blackberry

----- Original Message -----
From: Grobe, Jack
To: Brenner, Eliot
Cc: Jaczko, Gregory; Borchardt, Bill; Virgilio, Martin; Weber, Michael; Leeds, Eric
Sent: Sat Mar 12 22:18:57 2011
Subject: Fw: Update on Japan Situation

Eliot,

Not sure if you have seen this. Thought you would be interested in what the ANS is saying.

Jack
Jack Grobe, Deputy Director, NRR

----- Original Message -----
From: Joe Colvin <president@ans.org>
To: Grobe, Jack
Sent: Sat Mar 12 19:31:59 2011
Subject: Update on Japan Situation

Dear ANS Members:

I'm sure you are aware of the rapidly developing situation in Japan. The ANS is working on multiple fronts to collect credible information on the incident, and distribute that information through mainstream and social media outlets.

We have communicated with our counterparts at the Atomic Energy Society of Japan to offer any technical or other assistance which may be of help.

We have set up a special page on the ANS blog (http://ansnuclearcafe.org) to aggregate media reports and provide additional information when we consider it to be credible.

We are also working to organize television appearances and other media availabilities for our members so that some of the misinformation that has been presented by anti-nuclear groups can be rebutted with facts. Our goal is not necessarily to be the first on the air, but to be the most credible.

Attached you will find some talking points, along with our current analysis of the sequence of events at Fukushima I-1. I encourage you to talk to your social networks to ensure that people have the right facts and the proper perspective on this incident.

Let me know what other actions our Society should be taking during this nuclear incident.

My thoughts and prayers go out to the people of Japan.

Respectfully,

Joe Colvin

GGGG/3

American Nuclear Society Backgrounder:
Japanese Earthquake/Tsunami; Problems with Nuclear Reactors

3/12/2011 5:22 PM EST

To begin, a sense of perspective is needed... right now, the Japanese earthquake/tsunami is clearly a catastrophe; the situation at impacted nuclear reactors is, in the words of IAEA, an "Accident with Local Consequences."

The Japanese earthquake and tsunami are natural catastrophes of historic proportions. The death toll is likely to be in the thousands. While the information is still not complete at this time, the tragic loss of life and destruction caused by the earthquake and tsunami will likely dwarf the damage caused by the problems associated with the impacted Japanese nuclear plants.

What happened?

Recognizing that information is still not complete due to the destruction of the communication infrastructure, producing reports that are conflicting, here is our best understanding of the sequence of events at the Fukushima I-1 power station.

- The plant was immediately shut down (scrammed) when the earthquake first hit. The automatic power system worked.
- All external power to the station was lost when the sea water swept away the power lines.
- Diesel generators started to provide backup electrical power to the plant's backup cooling system. The backup worked.
- The diesel generators ceased functioning after approximately one hour due to tsunami induced damage, reportedly to their fuel supply.
- An Isolation condenser was used to remove the decay heat from the shutdown reactor.
- Apparently the plant then experienced a small loss of coolant from the reactor.
- Reactor Core Isolation Cooling (RCIC) pumps, which operate on steam from the reactor, were used to replace reactor core water inventory, however, the battery-supplied control valves lost DC power after the prolonged use.
- DC power from batteries was consumed after approximately 8 hours.
- At that point, the plant experienced a complete blackout (no electric power at all).
- Hours passed as primary water inventory was lost and core degradation occurred (through some combination of zirconium oxidation and clad failure).

- Portable diesel generators were delivered to the plant site.
- AC power was restored allowing for a different backup pumping system to replace inventory in reactor pressure vessel (RPV).
- Pressure in the containment drywell rose as wetwell became hotter.
- The Drywell containment was vented to outside reactor building which surrounds the containment.
- Hydrogen produced from zirconium oxidation was vented from the containment into the reactor building.
- Hydrogen in reactor building exploded causing it to collapse around the containment.
- The containment around the reactor and RPV were reported to be intact.
- The decision was made to inject seawater into the RPV to continue to the cooling process, another backup system that was designed into the plant from inception.
- Radioactivity releases from operator initiated venting appear to be decreasing.

Can it happen here in the US?

- While there are risks associated with operating nuclear plants and other industrial facilities, the chances of an adverse event similar to what happened in Japan occurring in the US is small.
- Since September 11, 2001, additional safeguards and training have been put in place at US nuclear reactors which allow plant operators to cool the reactor core during an extended power outage and/or failure of backup generators – "blackout conditions."

Is a nuclear reactor "meltdown" a catastrophic event?

- Not necessarily. Nuclear reactors are built with redundant safety systems. Even if the fuel in the reactor melts, the reactor's containment systems are designed to prevent the spread of radioactivity into the environment. Should an event like this occur, containing the radioactive materials could actually be considered a "success" given the scale of this natural disaster that had not been considered in the original design. The nuclear power industry will learn from this event, and redesign our facilities as needed to make them safer in the future.

What is the ANS doing?

ANS has reached out to The Atomic Energy Society of Japan (AESJ) to offer technical assistance.

ANS has established an incident communications response team.

This team has compiling relevant news reports and other publicly available information on the ANS blog, which can be found at ansnuclearcafe.org.

The team is also fielding media inquiries and providing reporters with background information and technical perspective as the events unfold.

Finally, the ANS is collecting information from publicly available sources, our sources in government agencies, and our sources on the ground in Japan, to better understand the extent and impact of the incident.

OIP_ITServices Resource

From: LIA02 Hoc
Sent: Tuesday, April 12, 2011 7:13 PM
To: Bloom, Steven
Subject: FW: help with our Japan team computer network - As requested the folder has been created.

From: Turner, Joseph
Sent: Tuesday, April 12, 2011 7:12:29 PM
To: Bernhard, Rudolph; ET02 Hoc; Liaison Japan
Cc: LIA02 Hoc; LIA08 Hoc; OST01 HOC; Reyes, Debra
Subject: Re: help with our Japan team computer network - As requested the folder has been created.
Auto forwarded by a Rule

I have notified the NOC and will let you know when the problem has been corrected.
This message was sent via Blackberry.

From: Bernhard, Rudolph
To: ET02 Hoc; Liaison Japan
Cc: LIA02 Hoc; LIA08 Hoc; OST01 HOC; Reyes, Debra; Turner, Joseph
Sent: Tue Apr 12 19:05:37 2011
Subject: RE: help with our Japan team computer network - As requested the folder has been created.

The HQ based folks have the mapping. I do not have the N:drive on logon. I tried to map the network drive, and was successful at getting a map, but do not have rights to read or write. The regional users on the team may need something else to gain access to the folder.

Thanks.
Rudy

From: ET02 Hoc
Sent: Tuesday, April 12, 2011 9:03 AM
To: Liaison Japan
Cc: LIA02 Hoc; LIA08 Hoc; OST01 HOC; Reyes, Debra; Turner, Joseph
Subject: FW: help with our Japan team computer network - As requested the folder has been created.
Importance: High

Japan Team:
Please read the information below provided by OIS (Debra Reyes) concerning access to a shared folder on the Citrix server for your use. If you have any questions or need help, please contact the CSC at 301-415-1234. Thanks...Karen Jackson

From: Reyes, Debra
Sent: Tuesday, April 12, 2011 7:59 AM
To: ET02 Hoc
Cc: Reyes, Debra
Subject: RE: help with our Japan team computer network - As requested the folder has been created.

Good morning,

GGGG/4

The NOC has created a folder named 'Liaison Japan' and a control group 'G-OIS-Liaison_Japan' on the existing HQ S: drive. Added the users from the spreadsheet provided to G-OIS-Liaison_Japan. Added G-OIS-Liaison_Japan to the folder Liaison Japan. Upon login the users in the group should receive a N: drive mapping to access the folder. The folder can also be accessed using the following link \\nrc.gov.nrc\hq\Shared\Liaison Japan. This can be copied to the desktop for use.

Please let me know if you need anything else.

debbie

From: ET02 Hoc
Sent: Monday, April 11, 2011 7:13 AM
To: Turner, Joseph; Reyes, Debra
Subject: FW: help with our Japan team computer network

Fyi...karen

From: Bernhard, Rudolph
Sent: Monday, April 11, 2011 6:27 AM
To: LIA08 Hoc; Rich, Thomas; Paradiso, Karen
Cc: ET02 Hoc
Subject: RE: help with our Japan team computer network

Jeff, thanks for kicking off the request. I had no clue who to ask.

A subdirectory that all in country Japan team members could be mapped to would be great. Since we are all from different offices, we have no common network drive that we share. We do not want to use Sharepoint, but want a subdirectory that we can map to a drive that all can reach when using Citrix. IT would have to be provided with names of those shipped over in the future, so they could be added to the access for the drive or subdirectory.

Thanks
Rudy

From: LIA08 Hoc
Sent: Monday, April 11, 2011 6:15 AM
To: Rich, Thomas; Paradiso, Karen
Cc: ET02 Hoc; Bernhard, Rudolph
Subject: help with our Japan team computer network

Good morning

Our Japan site team called us this morning and asked if a separate network could be created for them to use to store documents created by and used by the NRC site team in Japan, similar I think to the way we use the M drive in the NRC Ops Center to capture event info at our end.

Please let us know if this is possible and what the procedure is for this to occur.

Thanks for any help you can provide

Jeff Temple
NRC Operations Center
Liaison Team Coordinator
301-816-5185

From: OST01 HOC
Sent: Friday, April 15, 2011 2:08 PM
To: RST08 Hoc; Hoc, PMT12; Zimmerman, Roy
Subject: FW: Fukushima Hysplit Output - Using 04/15/2011 12Z GFS Model Run
Attachments: 2011041512.FUKUSHIMA-DAIICHI-1.rsmc93.pdf

FYI

-----Original Message-----
From: HOO Hoc [mailto:HOO.Hoc@nrc.gov]
Sent: Friday, April 15, 2011 2:02 PM
To: LIA07 Hoc; OST01 HOC
Subject: FW: Fukushima Hysplit Output - Using 04/15/2011 12Z GFS Model Run

---
From: NITOPS[SMTP:NITOPS@NNSA.DOE.GOV]
Sent: Friday, April 15, 2011 2:01:55 PM
To: CMHT; 'NARAC@LLNL.GOV'; HOO Hoc
Subject: FW: Fukushima Hysplit Output - Using 04/15/2011 12Z GFS Model Run Auto forwarded by a Rule

-----Original Message-----
From: Sdm@noaa.gov [mailto:Sdm@noaa.gov]
Sent: Friday, April 15, 2011 12:54 PM
To: sdm
Cc: oar.jp.iaea.results@noaa.gov
Subject: Re: Fukushima Hysplit Output - Using 04/15/2011 12Z GFS Model Run

Results for official use only--not to be distributed outside your organization without prior authorization from NOAA.

Attached is the latest NOAA Hysplit dispersion model run.

Release Time: 1700Z 04/15/2011
Release Duration: 72 hours
Model Run Duration: 72 hours
Meteorology used: 12Z NCEP GFS

This simulation was not an official request from the IAEA. This output reflects trajectories and dispersion of simulated current and future releases and does not reflect potential previous releases.

SDM Grant Newby

G666/5

U.S. NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

RSMC Washington (NOAA ARL, NOAA NCEP)

Room 410 - W/NMC33
World Weather Building
5200 Auth Road
Camp Springs, Maryland USA

Tel (24 hrs - NCEP): 301-763-8298
Tel (Backup - ARL): 301-713-2614

Fax (24 hrs - NCEP): 301-763-8592
Fax (Backup - ARL): 301-713-4592

RSMC products created Fri Apr 15 16:43 UTC 2011

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

Please contact us if any problems arise with these products.

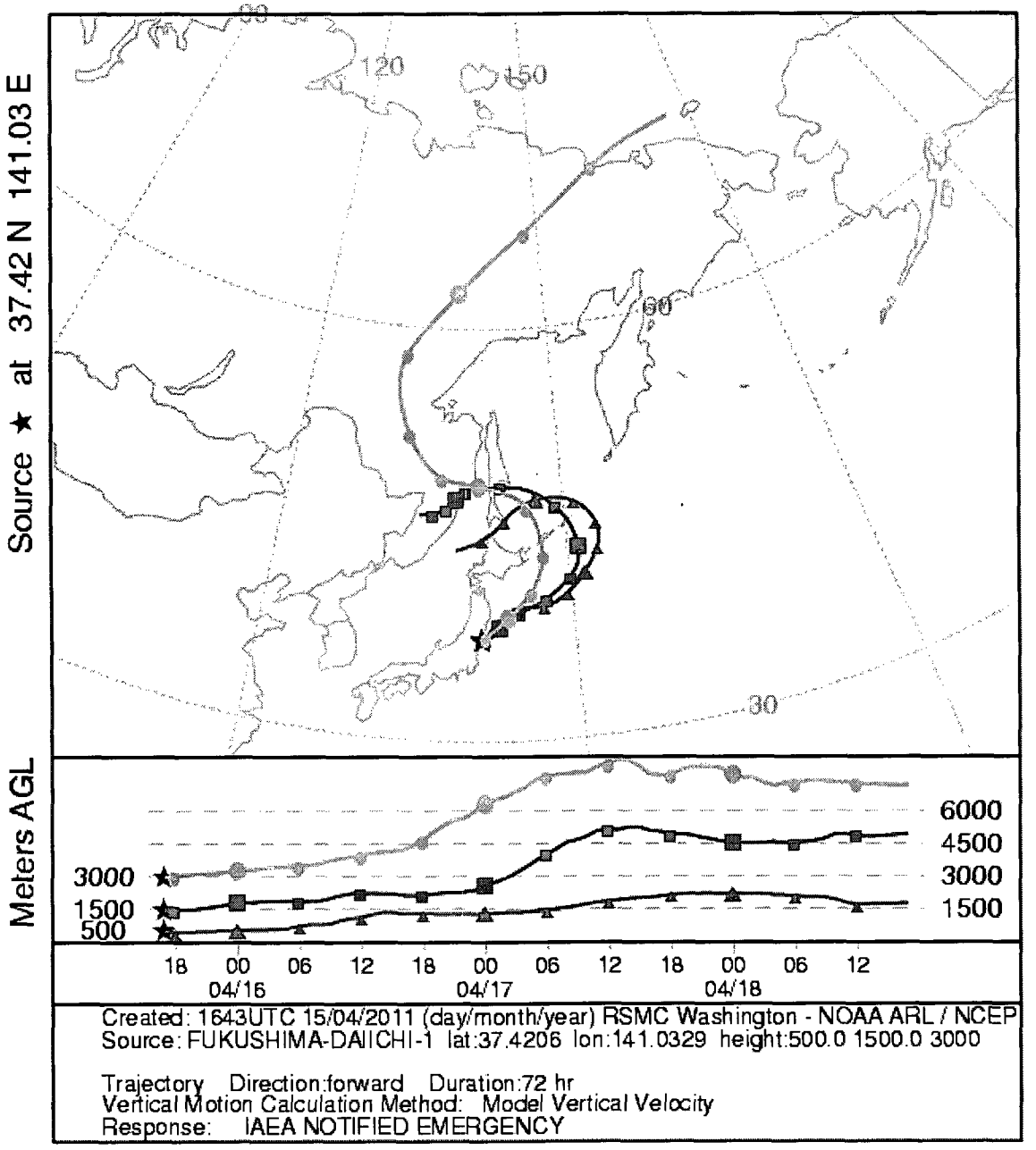
Source term and dispersion model details

RSMC Washington - NOAA ARL / NCEP

Response: IAEA NOTIFIED EMERGENCY

Location:FUKUSHIMA-DAIICHI-1 lat:37.4206 lon:141.0329
Release Start (YYYY MM DD HH MM):2011 04 15 17 00
Meteorology: 1200 UTC 15 Apr 2011 GFS
Trajectories: 500.0, 1500.0, 3000.0 m AGL
Release ID:I131 Rate: .0138 Bq/hr Duration: 72 hr Particles: 5000
Distribution: Uniform between 20 and 500 m AGL
Dry Deposition Rate:0.02 m/s Wet Removal (below/in-cloud):1.00E-04/3.20
Note: Contour values may change from chart to chart

NOAA HYSPLIT MODEL
Forward trajectories starting at 17 UTC 15 Apr 11
12 UTC 15 Apr GFSG Forecast Initialization

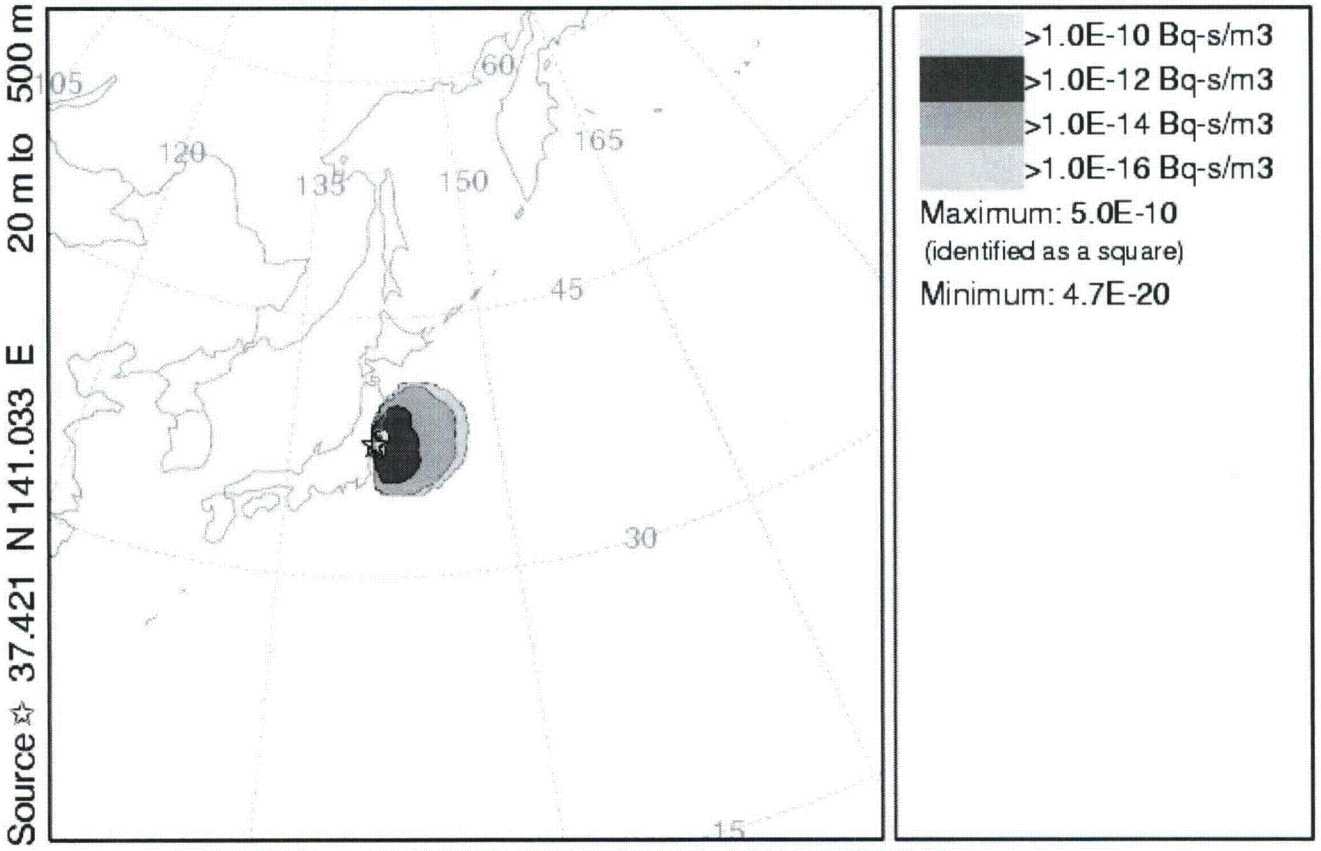


Created: 1643UTC 15/04/2011 (day/month/year) RSMC Washington - NOAA ARL / NCEP
Source: FUKUSHIMA-DAIICHI-1 lat:37.4206 lon:141.0329 height:500.0 1500.0 3000

Trajectory Direction:forward Duration:72 hr
Vertical Motion Calculation Method: Model Vertical Velocity
Response: IAEA NOTIFIED EMERGENCY

NOAA HYSPLIT MODEL

Exposure (Bq-s/m3) averaged between 0 m and 500 m
Integrated from 1200 15 Apr to 1200 16 Apr 11 (UTC)
I131 Release started at 1700 15 Apr 11 (UTC)



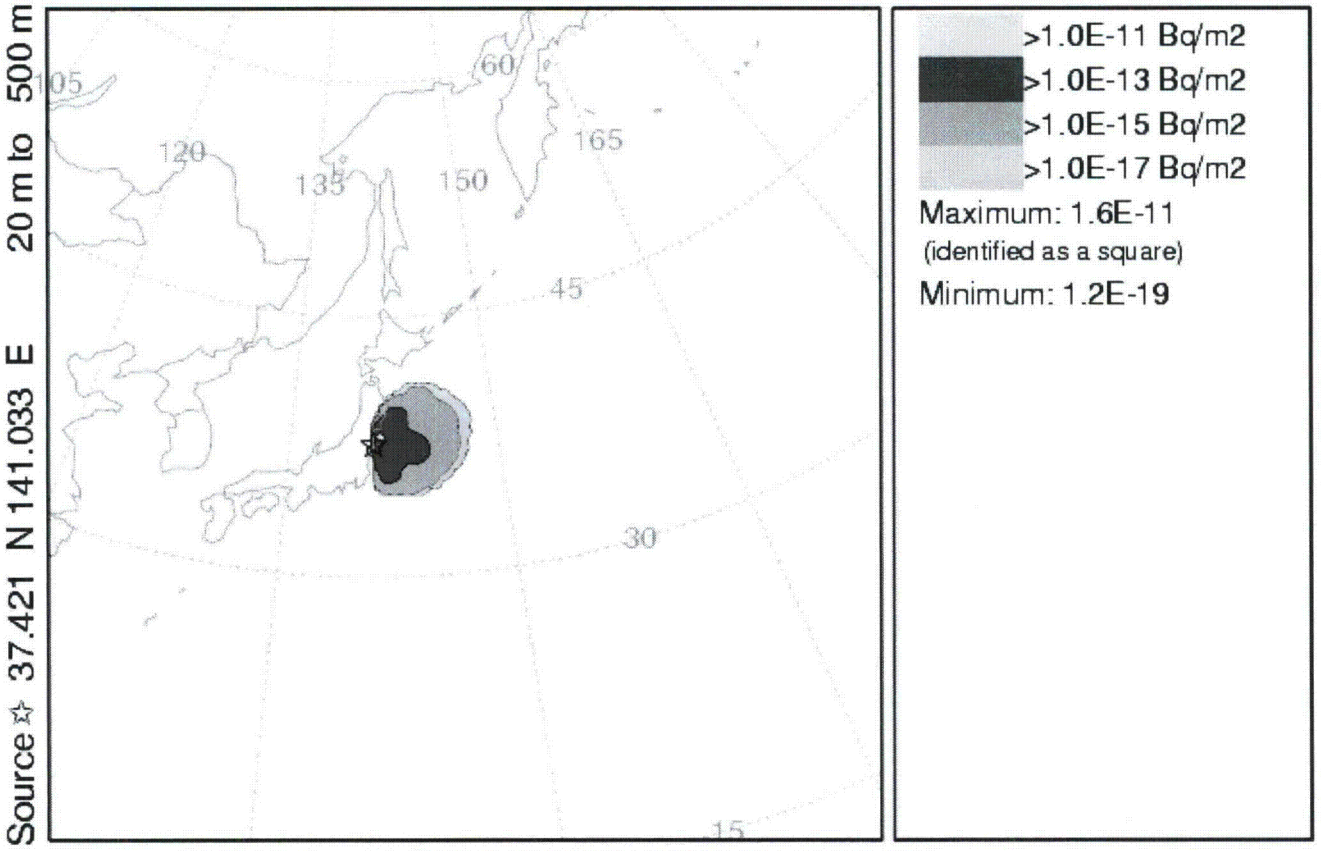
1200 15 Apr 11 GFSG FORECAST INITIALIZATION

Created: 1643UTC 15/04/2011 (day/month/year) RSMC Washington - NOAA ARL / NCEP
Source:FUKUSHIMA-DAIICHI-1 lat:37.4206 lon:141.0329 hgt:20 to 500 m
Release ID:I131 Rate: .0138 Bq/hr Duration: 72 hr Particles: 5000
Distribution: Uniform between 20 and 500 m AGL
Dry Deposition Rate:0.02 m/s Wet Removal (below/in-cloud):1.00E-04/3.20E+05
Meteorology: 1200 UTC 15 Apr 2011 GFS
Note: Contour values may change from chart to chart

Response: IAEA NOTIFIED EMERGENCY

NOAA HYSPLIT MODEL

Deposition (Bq/m2) at ground-level
Integrated from 1200 15 Apr to 1200 16 Apr 11 (UTC)
I131 Release started at 1700 15 Apr 11 (UTC)



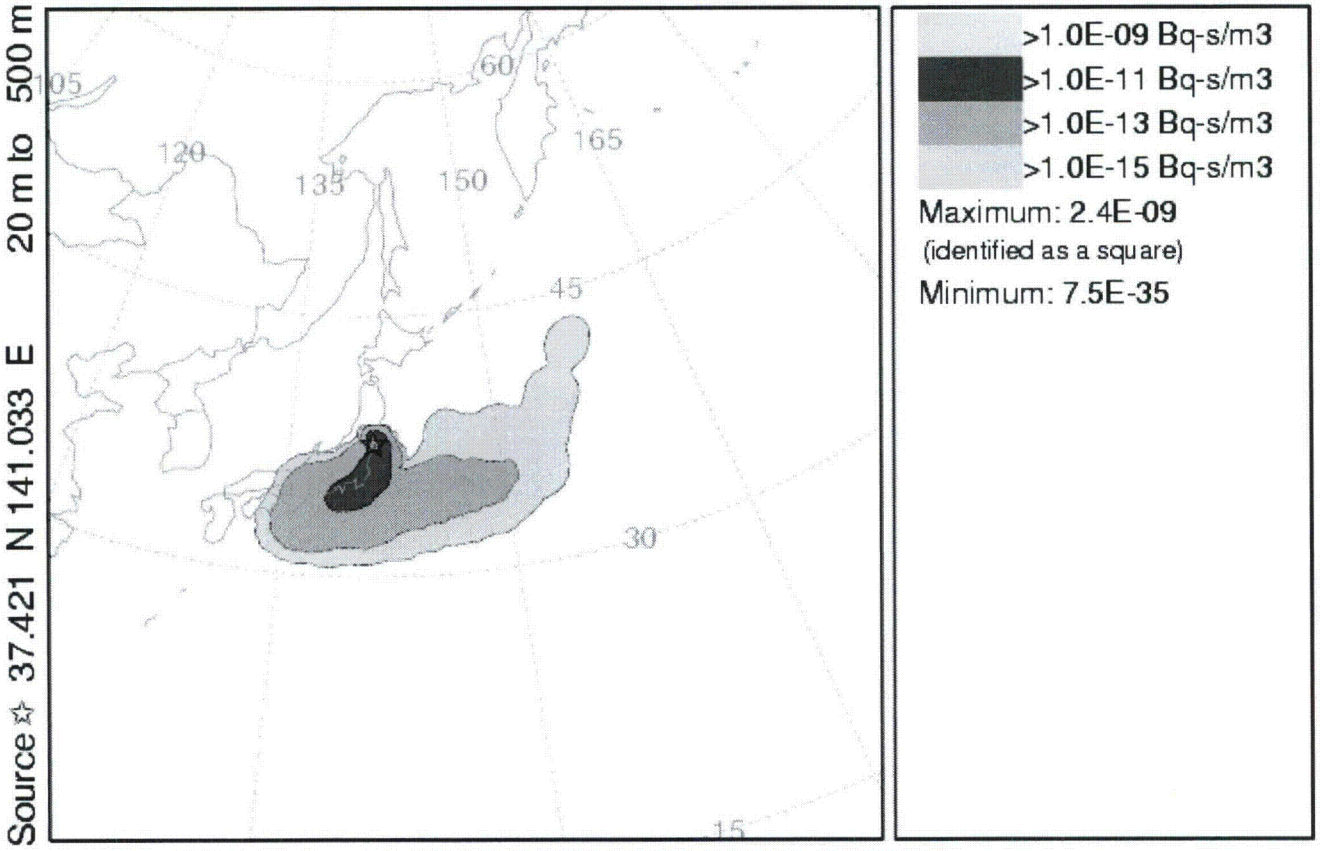
1200 15 Apr 11 GFSG FORECAST INITIALIZATION

Created: 1643UTC 15/04/2011 (day/month/year) RSMC Washington - NOAA ARL / NCEP
Source:FUKUSHIMA-DAIICHI-1 lat:37.4206 lon:141.0329 hgt:20 to 500 m
Release ID:I131 Rate: .0138 Bq/hr Duration: 72 hr Particles: 5000
Distribution: Uniform between 20 and 500 m AGL
Dry Deposition Rate:0.02 m/s Wet Removal (below/in-cloud):1.00E-04/3.20E+05
Meteorology: 1200 UTC 15 Apr 2011 GFS
Note: Contour values may change from chart to chart

Response: IAEA NOTIFIED EMERGENCY

NOAA HYSPLIT MODEL

Exposure (Bq-s/m3) averaged between 0 m and 500 m
Integrated from 1200 16 Apr to 1200 17 Apr 11 (UTC)
I131 Release started at 1700 15 Apr 11 (UTC)



1200 15 Apr 11 GFSG FORECAST INITIALIZATION

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Release ID:I131 Rate: .0138 Bq/hr Duration: 72 hr Particles: 5000
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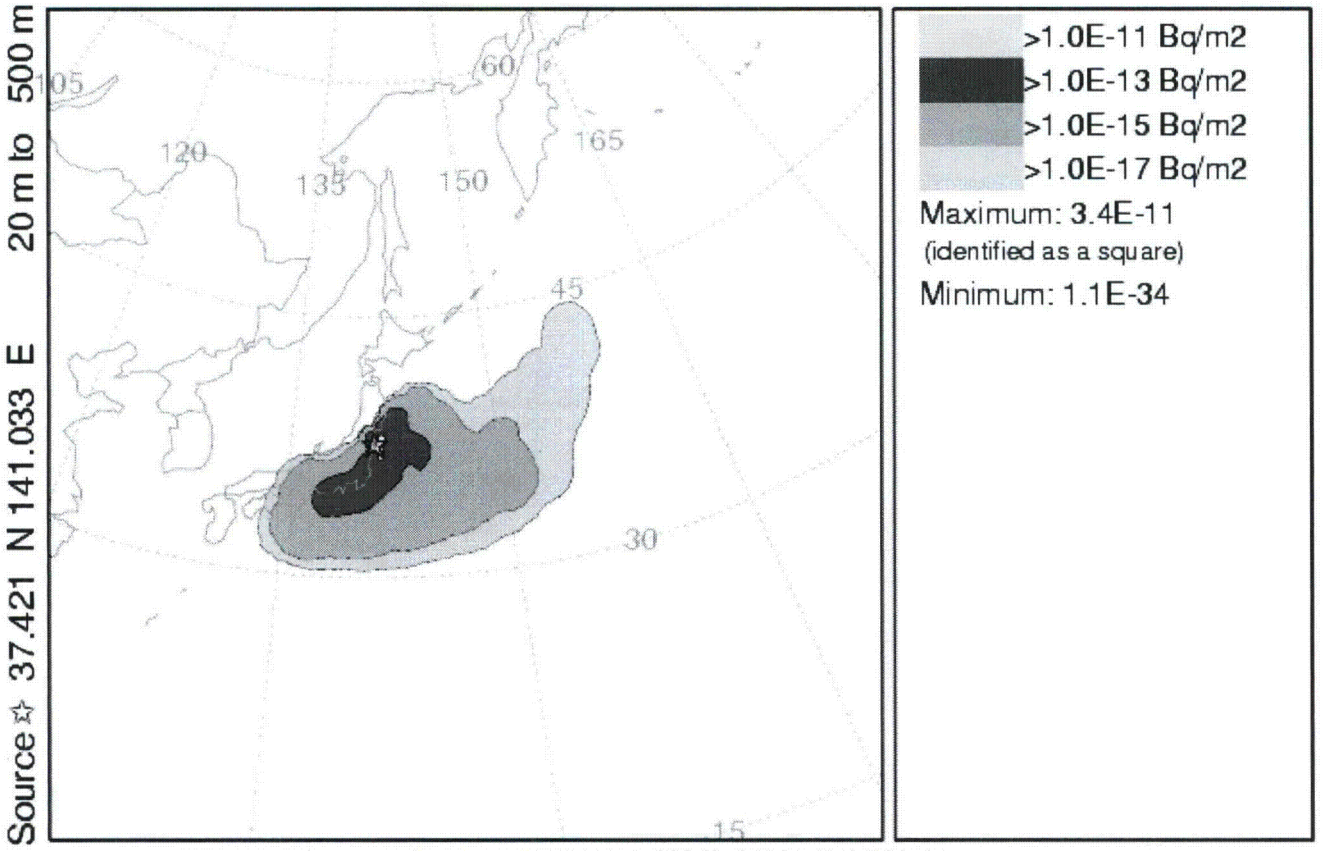
NOAA HYSPLIT MODEL

Deposition (Bq/m2) at ground-level
Integrated from 1200 15 Apr to 1200 17 Apr 11 (UTC)
I131 Release started at 1700 15 Apr 11 (UTC)



1200 15 Apr 11 GFSG FORECAST INITIALIZATION

Created: 1643UTC 15/04/2011 (day/month/year) RSMC Washington - NOAA ARL / NCEP
Source:FUKUSHIMA-DAIICHI-1 lat:37.4206 lon:141.0329 hgt:20 to 500 m
Release ID:I131 Rate: .0138 Bq/hr Duration: 72 hr Particles: 5000
Distribution: Uniform between 20 and 500 m AGL
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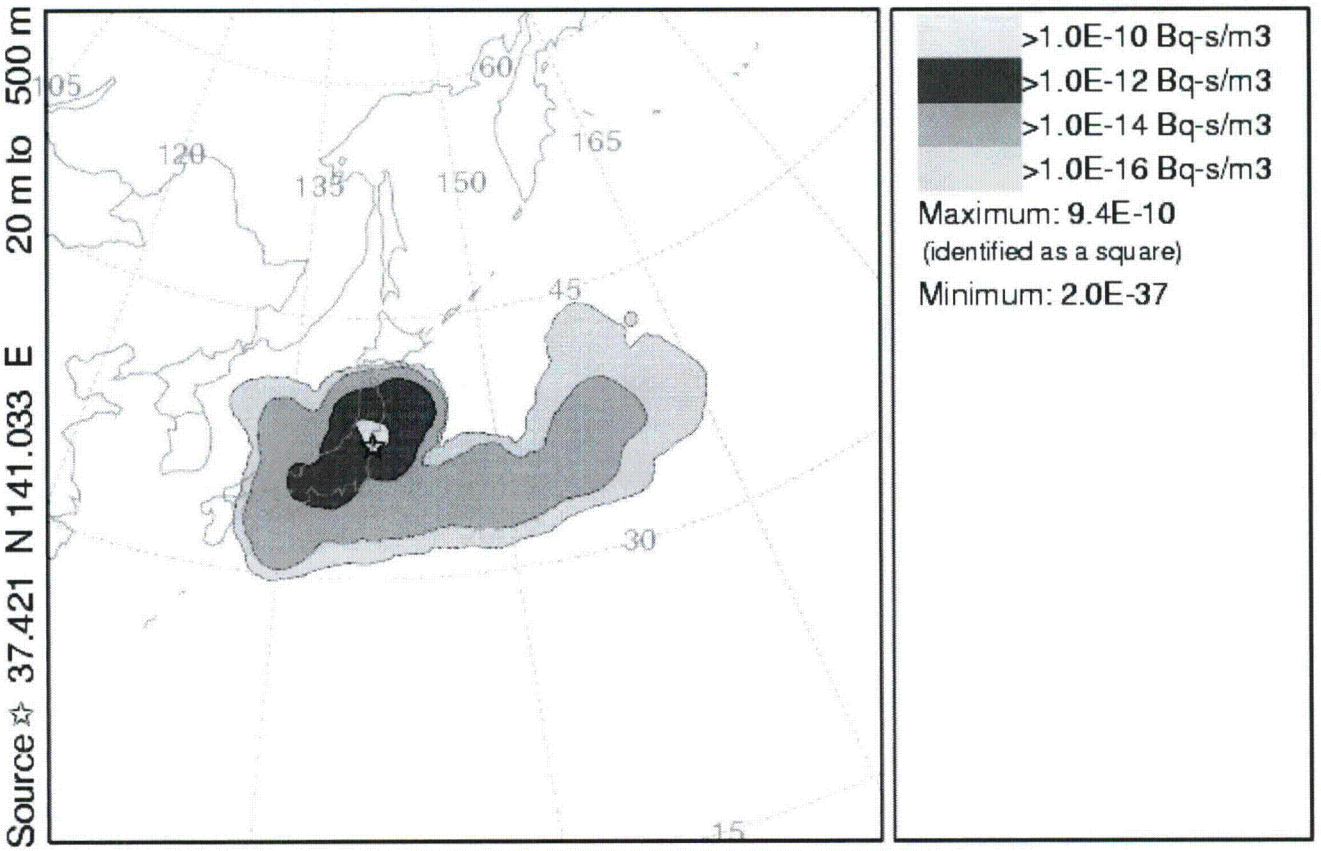
Meteorology: 1200 UTC 15 Apr 2011 GFS
Note: Contour values may change from chart to chart

Response: IAEA NOTIFIED EMERGENCY

NOAA HYSPLIT MODEL

Exposure (Bq-s/m3) averaged between 0 m and 500 m
Integrated from 1200 17 Apr to 1200 18 Apr 11 (UTC)
I131 Release started at 1700 15 Apr 11 (UTC)



1200 15 Apr 11 GFSG FORECAST INITIALIZATION

Created: 1643UTC 15/04/2011 (day/month/year) RSMC Washington - NOAA ARL / NCEP
Source:FUKUSHIMA-DAIICHI-1 lat:37.4206 lon:141.0329 hgt:20 to 500 m
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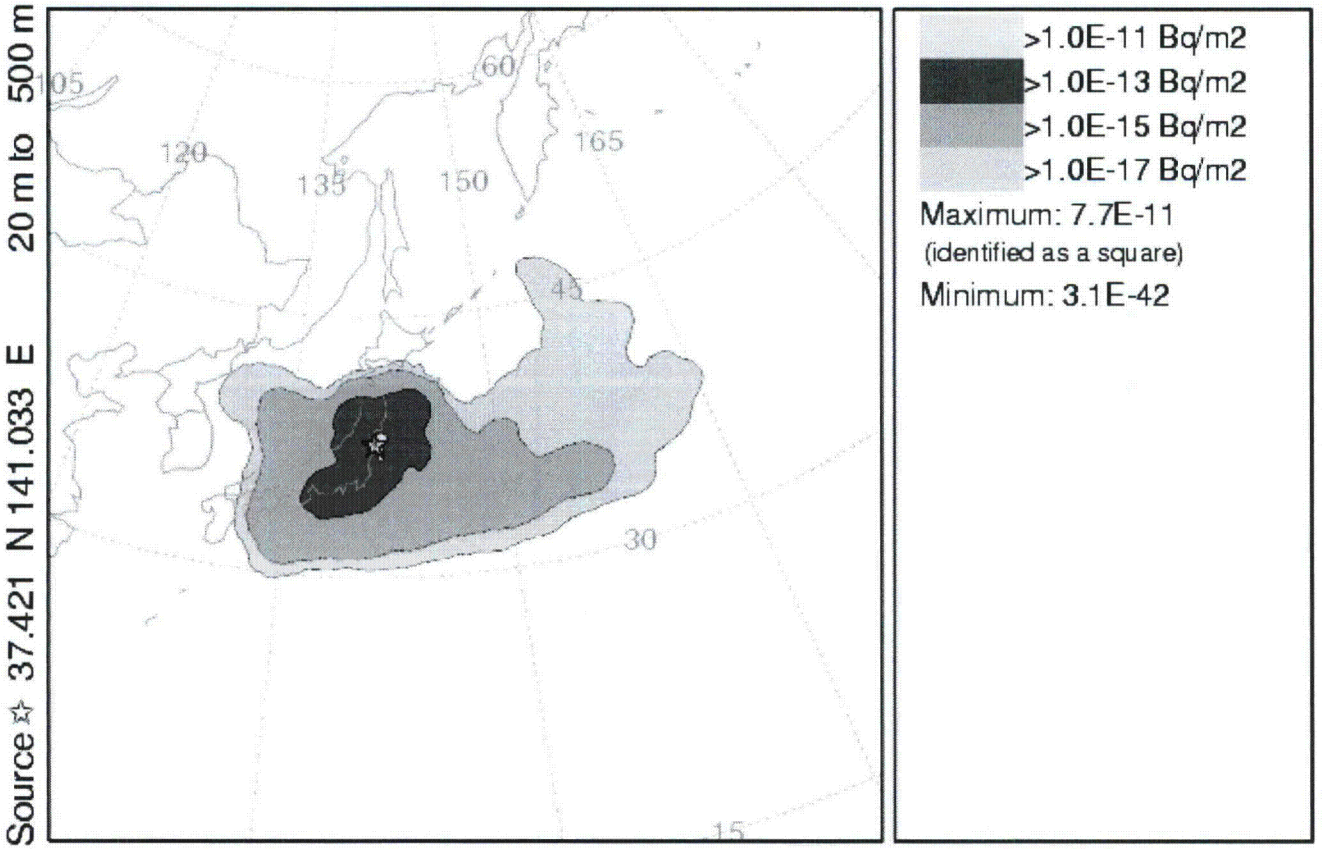
Note: Contour values may change from chart to chart

Response: IAEA NOTIFIED EMERGENCY

NOAA HYSPLIT MODEL

Deposition (Bq/m2) at ground-level
Integrated from 1200 15 Apr to 1200 18 Apr 11 (UTC)
I131 Release started at 1700 15 Apr 11 (UTC)



1200 15 Apr 11 GFSG FORECAST INITIALIZATION

Created: 1643UTC 15/04/2011 (day/month/year) RSMC Washington - NOAA ARL / NCEP
Source:FUKUSHIMA-DAIICHI-1 lat:37.4206 lon:141.0329 hgt:20 to 500 m
Release ID:I131 Rate: .0138 Bq/hr Duration: 72 hr Particles: 5000
Distribution: Uniform between 20 and 500 m AGL
Dry Deposition Rate:0.02 m/s Wet Removal (below/in-cloud):1.00E-04/3.20E+05
Meteorology: 1200 UTC 15 Apr 2011 GFS
Note: Contour values may change from chart to chart

Response: IAEA NOTIFIED EMERGENCY

From: OST02 HQC

To: Dorman, Dan; Virgilio, Martin; Borchardt, Bill; Weber, Michael; Ross-Lee, MaryJane; Hurd, Sapna; Pope, Tia; Perin, Vanice; Anderson, James; Chen, Yen-Ju; Kotzalas, Margie; Frazier, Alan; Figueroa, Roberto; Larson, Emily; Crutchley, Mary Glenn; Blount, Tom; Tschiltz, Michael; McGinty, Tim; Franovich, Rani; Turtil, Richard; Smith, Theodore; Chazell, Russell; Reed, Elizabeth; Salter, Susan; Lising, Jason; Shane, Raeann; Dacus, Eugene; Schmidt, Rebecca; Droggitis, Spiros; Powell, Amy; Riley (OCA), Timothy; Foggie, Kirk; Ramsey, Jack; Emche, Danielle; Abrams, Charlotte; Schwartzman, Jennifer; Mamish, Nader; Smith, Brooke; Fragoyannis, Nancy; Chowdhury, Prosanta; Ashkeboussi, Nima; Foster, Jack; Lubinski, John; Brock, Kathryn; Tappert, John; Casto, Greg; Rosenberg, Stacey; Watson, Bruce; Hart, Michelle; Schmidt, Duane; Clement, Richard; Huffert, Anthony; Sun, Casper; Case, Michael; Skeen, David; Ruland, William; Hiland, Patrick; Brown, Frederick; Dudes, Laura; Rini, Brett; Morlang, Gary; Cheok, Michael; Circle, Jeff; Dube, Donald; Brown, Eva; Esmaili, Hossein; Kolb, Timothy; Norton, Charles; Isom, James; Bloom, Steven; Padovan, Mark; Williams, Joseph; Hart, Ken; Williams, Donna

Subject: TAC # for Japan Earthquake and Tsunami Drill

Date: Sunday, March 13, 2011 5:09:03 AM

If you have participated in the "Japan Earthquake and Tsunami Drill" that began today (Friday March 11, 2011), please be sure to apply your time spent on this activity to the TAC Number listed below:

D92374 – Incident Response: Japan Earthquake and Tsunami Drill

GGGG/6

From: Diec, David NSIR
To: Correia, Richard; Layton, Michael; Huyck, Doug; Wastler, Sandra; Caldwell, Robert
Subject: Radiation, Possible Contamination and Exposure @ Japan"s NPPs
Date: Monday, March 14, 2011 10:37:07 AM
Attachments: PDFAnsicht.pdf

FYI

6666/7

14 March 2011 / **Japan Update / No. 62a**

NucNet Backgrounder On Radiation, Possible Contamination and Exposure Assessment at Japan's Nuclear Power Plants

Situation as of 14 March 2011

Measuring and monitoring equipment

As in other countries, every nuclear installation site in Japan operates a permanent system to monitor radioactivity levels on nuclear sites and in the environment. The system includes permanent monitoring at the ventilation stack exhaust and at cooling water outlets. There are a number of fixed permanent measurement posts (MPs) at site boundaries, and mobile measuring equipment is used for checking environmental radiation levels inside and outside the plant site perimeter.

Monitoring operations

The results of permanent monitoring are transmitted in real-time to a number of organisations including the Ministry of Economy, Trade and Industry's Nuclear and Industrial Safety Agency (NISA). Abnormal readings result in alerts.

The earthquake of 11 March 2011 did not cause serious damage to this system and NISA is periodically publishing results on its Japanese website. Tepco has used the readings in its media releases in Japanese and English.

According to NISA's media releases, at Tepco's Fukushima-Daini nuclear plant site and at Tohoku's Onagawa nuclear plant site, readings have remained normal. In other words, there were no relevant, or above normal, amounts of radioactive substances released into the environment (as of 14 March 2011 at about 04:00 local time). On 13 March, monitoring at Onagawa indicated an unexpected increase. Local investigations revealed that the source was outside the site and transient. Since then, levels have fallen to normal values again.

Cont'd . . .

www.worldnuclear.org
NucNet Tel +32 2 505 30 55 / 56 Fax +32 2 502 39 02
NucNet Hotline (for emergency reporting only) +32 476 890 674

Upward trend at Daiichi since Saturday

NISA's monitoring at Tepco's Fukushima-Daiichi nuclear plant site did not indicate values above the normal level until 12 March at 04:00 local time. On 12 March at 07:00, NISA said there was an increase in monitoring post (MP) readings. Instead of the normal value of 0.07 microsieverts per hour (microSv/hr), the dose rate readings were:

• at MP no. 6 (MP6) near the main gate 0.59 microSv/hr,

• at MP8 in an elevated position 0.38 microSv/hr on 12 March at 4:30 local time.

With these increased dose rate levels, the legal annual dose limit of 1 millisievert per year (mSv(yr) for the most exposed member of the public would have been reached within 70 days instead of 365.

Note that the annual dose limit for controlled nuclear workers or medical personnel is 20 mSv per year, but may reach 50 mSv in an exceptional year when the 5-year average is not higher than 20 mSv, according to recommendations by the International Commission on Radiological Protection (ICRP). In a declared emergency, the recommended limit is 100 mSv according to ICRP's recommendations. Japan has adopted the ICRP's recommendations.

Further readings showed a marked "up and down" development, depending on weather conditions – in particular prevailing wind direction – and measures taken by the plant operators – in particular the venting of the primary containment vessel (PCV):

- on 12 March (local time):
  - at MP6 5.1 microSv/hr at 07:30 and at MP8 2.5 microSv/hr at 07:40
  - at MP6 5.1 microSv/hr at 09:10 and at MP8 2.9 microSv/hr at 09:40
  - at MP6 6.7 microSv/hr at 11:00 and at MP8 5.3 microSv/hr at 12:00
  - at MP6 8.9 microSv/hr at 14:40 and at MP8 3.8 microSv/hr at 14:40
  - at MP4 near car site 1015 microSv/hr at 15:29, at MP6 3.25 microSv/hr at 16:40, at MP8 2.06 microSv/hr at 16:40, and at site boundary with mobile equipment about 500 microSv/hr at 15:29 during filtered venting of the primary containment vessel (PCV) started at 14:40
  - at MP4 near car site 59.1 microSv/hr at 20:26, at MP6 3.2 microSv/hr at 20:30, and at MP8 2.06 microSv/hr at 16:40

Cont'd. . .

- on 13 March (local time):
  - at MP4 near car site 40 microSv/hr at 03:08, at MP6 3.1 microSv/hr at 02:50, and at MP8 4.5 microSv/hr on 13 March at 02:50
  - at MP6 3.2 microSv/hr at 5:50 and at MP8 5,2 microSv/hr at 5:50
  - at MP1 northernmost (instead of MP8) 17 microSv/hr at 11:40, at MP4 47 microSv/hr at 12:20, and at MP6 26 microSv/hr at 9:30
  - at MP1 26 microSv/hr at 18:30, at MP4 44 microSv/hr at 19:33, and at MP6 5.2 microSv/hr at 19:00
- on 14 March (local time):
  - at MP2 north-northwest 680 microSv/hr at 03:50
  - at MP4 56.4 microSv/hr at 04:08
  - at MP6 66.3 microSv/hr at 02:50
  - at MP6 20 microSv/hr at 11:44 according to Tepco after detonation of the outer containment building of unit 3

Summary

The readings at the various MPs on Fukushima-Daiichi's boundary began to rise above normal during the night of Friday and on Saturday, with ups and downs depending on weather and activity, and a measured peak value of 1015 microSv/hr at the most exposed point during the first venting of unit 1. The general trend was still upwards on Monday morning, 14 March.

The normal value before the release of radioactive materials was 0.07 microSv/hr. In the meantime, the average dose rate has reached a range of 5 to 50 microSv/hr.

For comparison: in most countries, the natural background radiation level is in the range of 0,2 to 0,5 microSv/hr (including the natural radon background radiation in buildings) or about 2 to 4 mSv/yr.

Radioactive iodine and caesium found

According to Tepco, the releases are composed of radioactive noble gases, including radioactive xenon isotopes. These decay into radioactive iodine, which can become a particular health problem when contaminating diary food or if they are inhaled. However, the controlled intake of iodine is an efficient preventive measure.

The radioactive releases also contain other radioactive isotopes, in particular caesium and tellurium. The total level is above legal limits, but below the orders of magnitude seen after other

nuclear accidents and a disaster like "Chernobyl". Tepco and NISA are carrying out detailed analysis, but have not yet published complete figures (as of 14 March).

One case of overexposure

Only one person has been exposed to a radiation dose above recommended emergency limits: a worker at Fukushima Daiichi with a measured dose of 106 mSv. Another worker has accumulated a dose of 96 mSv – a still acceptable level in declared emergencies.

Screening of public

About 180,000 members of the general public have been evacuated from the 20-kilometre zone around Fukushima Daiichi, from the 10-km zone around Fukushima-Daini, and from the 3-km zone around Onagawa, or have been ordered to stay indoors. Among these people, only about 200 have possibly been contaminated. In cases of doubt, members of the public should be screened for shoe, clothing, and body contamination in hospitals and other specialised medical centres.

According to NISA, the controlled screening has begun of people who are concerned about possible exposure. First results show contamination in certain cases. Whole body measurements with 18,000 to 40,000 counts per minute were found in 4 cases out of 9. Another 5 cases showed no contamination. Note: the critical value is more than 100,000 counts per minute.

In some cases, the result was above the critical value, but when the shoes were taken off, the result was significantly lower.

Screening had not finished as of March 14.

Sources

• NISA reporting on "Nuclear-related Emergency Information / Earth-quake effects on nuclear facilities", parts 10 to 22 (Japanese version in Google assisted translation)

Time stamp of part 20 is "2011/03/14 07:30 Update" (23:30 CET)

• Tepco releases of 12 March 06:00, 20:00, 21:00; 13 March 08:00, 09:00, and 13:00 local time (05:00 CET)

>>>Related reports in the NucNet database (available to subscribers)

Tepco Confirms Venting Of Unit 1, 'Reactor Not Affected' By Explosion (News in Brief No. 55, 12 March 2011)

Japan Says Containments Are Intact At All Fukushima-Daiichi Units (News in Brief No. 57, 13 March 2011)

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NucNet Tel +32 2 505 30 55 / 56 Fax +32 2 502 39 02
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From:	Leeds, Eric
To:	Collins, Elmo; Satorius, Mark; McCree, Victor; Dean, Bill; Sheron, Brian; Tracy, Glenn; Hudson, Jody; Johnson, Michael; Miller, Charles; Haney, Catherine; Zimmerman, Roy; Stewart, Sharon; Virgilio, Martin; Weber, Michael; Borchardt, Bill; Mamish, Nader; Doane, Margaret; Muessle, Mary
Cc:	Boger, Bruce; Grobe, Jack; Ruland, William; Meighan, Sean
Subject:	Confirmation of names for Japan
Date:	Monday, March 14, 2011 1:11:30 PM

Folks –

Thanks so much for your help – we have a strong database of names/expertise to support the Japanese. For this first wave, we are sending Chuck Casto, John Monninger, Tony Nakanishi, Tim Kolb, Jack Foster and Richard Devercelly. I believe that Bruce Boger has contacted all those going to join Tony Ulsis and Jim Trapp in Japan.

I imagine that at some point we may need to send a second wave of responders to relieve our first wave. We will let you know as soon as we know if this needs to be done. We are also sensitive not to over-burden any one office.

Thanks again for your support!

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

GGGG/8

From: Sheron, Brian
To: Johnson, Michael; Holahan, Gary
Cc: Leeds, Eric; Virgilio, Martin; Borchardt, Bill; Grobe, Jack; Boger, Bruce; Williams, Donna; Wiggins, Jim
Subject: RE: Recommendation for proactive action by NRC in light of Japan events
Date: Monday, March 14, 2011 2:07:47 PM

It would be nice if the industry was even more proactive, by having NEI send us a letter says something to the effect that in the wake of the Japanese disaster here is a list of all the things the commercial U.S. nuclear licensees are doing. Hopefully this would be the kind of stuff Gary mentioned, and maybe other stuff as well.

From: Johnson, Michael
Sent: Monday, March 14, 2011 2:02 PM
To: Holahan, Gary
Cc: Leeds, Eric; Virgilio, Martin; Borchardt, Bill; Grobe, Jack; Boger, Bruce; Sheron, Brian; Williams, Donna; Wiggins, Jim
Subject: RE: Recommendation for proactive action by NRC in light of Japan events

Thanks Gary. NRR's lead of course. I like the idea using this as an opportunity to highlight the importance of previous requirements/actions as a proactive step. We will need to think about the correct vehicle. I also like having industry involved up front in whatever we decide to do.

From: Holahan, Gary
Sent: Monday, March 14, 2011 1:55 PM
To: Johnson, Michael
Cc: Leeds, Eric; Virgilio, Martin; Borchardt, Bill; Grobe, Jack; Boger, Bruce; Sheron, Brian; Williams, Donna; Wiggins, Jim
Subject: Recommendation for proactive action by NRC in light of Japan events

Mike,

The events in Japan reinforce the importance of preparedness for the unexpected. In that light, I suggest that NRC take some form of proactive step to reinforce both the Severe Accident Management Guidelines and the 50.54 (hh) (formerly B.5.b) protection for "Loss of Large Area of the plant from fires and explosions".

50.54 (hh) seems particularly relevant, stating "Each licensee shall develop and implement guidance and strategies intended to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities under the circumstances associated with loss of large areas of the plant due to explosions or fire..."

The NRC could issue Orders, Bulletins, or letters on an expedited basis (in the next few days) to require or encourage licensees to confirm their readiness to implement the severe accident management guidance and strategies under 50.54 (hh). This would not involve any new requirements, but would simply reinforce the existing requirements.

I recommend that we coordinate this activity with the industry to ensure their full and early cooperation. This would be similar to the level of cooperation we undertook for the security bulletins following 9/11.

GGGG/9

Gary

From: Borchardt, Bill
To: Ash, Darren
Subject: RE: Support for those travelling to Japan
Date: Monday, March 14, 2011 5:06:00 PM

Impressive!

From: Ash, Darren
Sent: Monday, March 14, 2011 5:03 PM
To: Borchardt, Bill; Monninger, John
Subject: FW: Support for those travelling to Japan

For your awareness – no reply requested

From: Paradiso, Karen
Sent: Monday, March 14, 2011 4:51 PM
To: Ash, Darren
Cc: Rich, Thomas; Boyce, Thomas (OIS); Schaeffer, James
Subject: Support for those travelling to Japan

Hi Darren,

We have been working today to respond to the needs of those staff members travelling to Japan. This afternoon OIS provided to the Agency Operations Center –

7 new Blackberry's with International Service and in addition International Service was provided for one existing Blackberry;

5 international laptops were provided,
5 international air cards were provided – one for each laptop;

8 mxi thumb drives were provided;

8 mci calling cards were provided – we wanted to provide GETS cards however, it takes 3 days to order this service.

We will continue to coordinate with the Operations Center and provide support as needed.

Please let me know if any questions.

Thanks!
Karen

GGGG/10

From:	Casto, Chuck
To:	Monninger, John; Nakanishi, Tony; Kolb, Timothy; Foster, Jack; Cook, William; Devercelly, Richard; Ulses, Anthony; Trapp, James; Smith, Brooke; Foggie, Kirk
Cc:	Virgilio, Martin; Borchardt, Bill; LIA10 Hoc
Subject:	Travel and thoughts
Date:	Monday, March 14, 2011 9:23:08 PM

Folks, i don't know if and when you might get this email, but here's some thoughts for our work.

Let me know if you need anything. The Chairman and EDO are fully supporting our needs and they clearly expressed that to me.

We are to support the Ambassador in all ways possible.

My flight may be the last to arrive. Seemingly the logistics from Atlanta are difficult. I am on a flight to Dallas now.

Let's think about organization of the team. It seems to me that we need a reactor safety team, protective measures, recovery/severe accident, and liaison team.

First we need briefings by Jim and Tony. Then a briefing by the host. Plus we need an operations center or place to work from. I believe that we have some KI but might need more.

Please think about who is on what group, I.e. Team. Then we probably need to reach back to resources in the US. For instance we may want to set up a bridge with general electric, INPO, and other technical groups.

For the protective measures team let's think about reaching back to DOE/FERMAC for advice.

You get my point. While I don't know the organizational situation over there, absent any other arrangement, let's form teams like we would in the US, and reach back to our counterparts, both federal and industry to accomplish our work. I would suggest using the Hoo Liaison team for coordination. We need to leverage all assets for maximum effect.

John I would suggest that you work with Brooke and Kirk.

Those are merely initial thoughts and suggestions. I know it will likely change immediately upon arrival.

I am anxious to get there and work with this break group and our counterparts back home.

See you soon.

Chuck

GGGG/11

From: NRC Announcement
To: NRC Announcement
Subject: From the Chairman: Events in Japan
Date: Tuesday, March 15, 2011 9:37:28 AM

NRC Daily Announcements Highlighted Information and Messages

Tuesday March 15, 2011 -- Headquarters Edition

From the Chairman: Events in Japan

From the Chairman: Events in Japan

By now I am sure that most of you are aware of the tragic earthquake and tsunami that struck Japan last week, killing thousands of people, destroying cities and infrastructure, and knocking out large portions of the electricity grid.

I am so proud of our staff and the dedication and tenacity they have shown during the tragic events of the past several days. NRC employees have been willingly working around the clock, and their energy, experience and expertise have been invaluable to our response. Those of you who have not directly been involved in this effort are playing just as valuable a role in making sure that the facilities we license are safe and secure.

The natural disasters in Japan—and the resulting situations at the Fukushima nuclear power plant—are sobering in their size and scope. It's easy to become distracted by the stories and images of devastation and destruction. The best thing we can do in this situation is to make sure we remain mindful of our responsibilities for the safety and security of our existing nuclear plants and materials, and to keep our focus where it must always be—on our mission. I continue to appreciate your dedication to ensure the safety and security of the American people.

(2011-03-15 00:00:00.0) View item in a new window

GGGG/12

From: Weber, Michael
To: Borchardt, Bill
Subject: Response - Charlie Tinkler will support the Chairman
Date: Tuesday, March 15, 2011 12:19:37 PM

Thanks

From: Borchardt, Bill
To: Leeds, Eric
Cc: Taylor, Renee; Weber, Michael; Sheron, Brian; Uhle, Jennifer; Boger, Bruce; Ruland, William
Sent: Tue Mar 15 11:58:11 2011
Subject: Re: Charlie Tinkler will support the Chairman

Thanks Eric. I will already be downtown. I suggest that Charlie take metro today since the meeting will be next to union station.
Bill Borchardt
Via blackberry

From: Leeds, Eric
To: Borchardt, Bill
Cc: Taylor, Renee; Weber, Michael; Sheron, Brian; Uhle, Jennifer; Boger, Bruce; Ruland, William
Sent: Tue Mar 15 11:36:07 2011
Subject: Charlie Tinkler will support the Chairman

Bill –

RES will supply Charlie Tinkler for this afternoon's activities with the Chairman and tomorrow's briefings on the hill. We'll have him contact Rene to get travel info – so he will travel with you this afternoon. Big thanks to Jennifer for making this happen!

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

GGGG/13

From:	Sheron, Brian
To:	Leeds, Eric; Borchardt, Bill
Cc:	Taylor, Renee; Weber, Michael; Uhle, Jennifer; Boger, Bruce; Ruland, William
Subject:	RE: Charlie Tinkler will support the Chairman
Date:	Tuesday, March 15, 2011 1:36:47 PM

Charlie was not feeling well. Jason Shaperow will be going. Jennifer is going with him.

From: Leeds, Eric
Sent: Tuesday, March 15, 2011 11:36 AM
To: Borchardt, Bill
Cc: Taylor, Renee; Weber, Michael; Sheron, Brian; Uhle, Jennifer; Boger, Bruce; Ruland, William
Subject: Charlie Tinkler will support the Chairman

Bill –

RES will supply Charlie Tinkler for this afternoon's activities with the Chairman and tomorrow's briefings on the hill. We'll have him contact Rene to get travel info – so he will travel with you this afternoon. Big thanks to Jennifer for making this happen!

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

GGGG/14

From: Reyes, Debra
Sent: Tuesday, April 12, 2011 2:08 PM
To: ET02 Hoc
Subject: RE: Re-establish a Japan Traveler's BB

Hi Karen,

Because the BlackBerries are provided by the TSC, the second tickets are created for the TSC to complete their records. I am following up with the CSC on the answers to your remaining questions and will provide you an answer as soon as I hear back from them.

debbie

From: ET02 Hoc
Sent: Tuesday, April 12, 2011 1:53 PM
To: Reyes, Debra; Turner, Joseph
Subject: FW: Re-establish a Japan Traveler's BB
Importance: High

Quick question – do you know why my request become two tickets? Also, do I need to ok the ticket since I'm the Ops Center IT Coordinator or is this type of request going to Rob Taylors' IT Coordinator who might not have any knowledge about his trip to Japan and why this request was made? What's the normal turnaround time for this type of request? Thanks...karen

---

From: CSC
Sent: Tuesday, April 12, 2011 12:20 PM
To: ET02 Hoc
Cc: Reyes, Debra; Turner, Joseph; Erskine, Pamela; Hart, Robin; Hincke, John
Subject: RE: Re-establish a Japan Traveler's BB

The Customer Support Center has received your support request.

Your reference numbers are listed below. Please use these referral numbers when contacting the Customer Support Center for status inquiries regarding your current support request.
511675- 511676

Please feel free to e-mail or call us at 301-415-1234 if you require further assistance.

Thank you for contacting the Customer Support Center.

Jude Moise
NRC Customer Support Center
Two White Flint North, 5th floor C-14
Hours: 6:00 AM-9:00 PM (M-F)
Hours: 9:00 AM-9:00 PM (Sat-Sun)
(301) 415-1234

GGG6/15

From: Weber, Michael
Sent: Tuesday, March 15, 2011 6:35 PM
To: RST01 Hoc
Cc: HOO Hoc; Grobe, Jack
Subject: FYI - Industry Efforts

Update on actions being taken by the industry in response to the evolving Japanese nuclear emergencies.

From: Leeds, Eric
Sent: Tuesday, March 15, 2011 5:27 PM
To: Borchardt, Bill; Virgilio, Martin
Cc: Weber, Michael
Subject: FYI: Industry Efforts

FYI – Please see Bruce's email below. NRR is considering short term and longer term actions in response to the Japanese event. We're considering a measured regulatory response to put an initial footprint on the issue. Its positive to see the industry get out ahead of it – whatever planning they did based on the BP experience seems to be in play. We will keep you in the loop.

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

From: Boger, Bruce
Sent: Tuesday, March 15, 2011 5:04 PM
To: Leeds, Eric; Grobe, Jack; Ruland, William
Cc: Dean, Bill; Lew, David; McCree, Victor; Wert, Leonard; Satorius, Mark; Pederson, Cynthia; Collins, Elmo; Howell, Art; Virgilio, Martin; Thomas, Eric; Brown, Frederick
Subject: Industry Efforts

I spoke with Randy Edington (CNO Palo Verde) and later with Steve Nichols (INPO) regarding industry actions as a result of the situation in Japan. The CNOs teleconferenced over the weekend and agreed to a series of near-term actions. INPO issued a Level 1 Event Report (highest level) to its members this afternoon. It identifies 4 actions, with due dates, and requires a written response. In general, the actions include walkdowns and verifications of aspects of facility capabilities to address B.5.b equipment and procedures, SAMGs, mitigation of SBO conditions, mitigation of internal and external flooding, and fire and flooding events that could be impacted by a concurrent seismic event. This should help shape the generic communication we've been discussing. INPO is figuring out how quickly they will be able to share the report with us. The report won't be available to the public, but we can share it internally.

GGGG/16

From: Library Resource
To: EPUB - Nuclear News Flashes
Subject: FW: Platts Nuclear News Flashes
Date: Tuesday, March 15, 2011 8:48:32 PM
Attachments: NNF 20110315.txt

From: Platts[SMTP:SUPPORT@PLATTS.COM]
Sent: Tuesday, March 15, 2011 8:48:02 PM
To: Library Resource
Subject: Platts Nuclear News Flashes
Auto forwarded by a Rule

Dear Subscriber,

This email contains your Platts newsletter subscription.

Nuclear News Flashes
Tuesday, Mar 15, 2011

[Inside This Issue:]

GGGG/17

** US reactor report

*** IAEA increasing response to Japan reactors: Amano

The IAEA is increasing its response to ongoing developments at the Fukushima-I-1 reactor in Japan, IAEA Director General Yukima Amano said March 15.

Amano said at the afternoon press briefing that a Fukushima Accident Coordination Team has been formed at the IAEA, which he will head and run with assistance from Deputy Director General Denis Flory.

Following the fire in the spent fuel pool of Fukushima-I-4, also called Fukushima Daiini-4, on March 15, Amano said, "I felt the need to raise the level of response on the part of the IAEA."

Following the release of radiation from the spent fuel pool fire, Amano said, radioactive iodine and cesium had been detected "near Tokyo," Amano said at the briefing.

The IAEA will provide environmental monitoring assistance to Japan and will also help coordination assistance to Japan, he said.

For more stories on the Japan nuclear crisis, see the March 17 issue of Nucleonics Week.

*** Germany to shut seven reactors for safety reviews

German Chancellor Angela Merkel announced March 15 the provisional shutdown for three months of seven nuclear reactors pending a safety review in light of events in Japan.

Merkel had announced the previous day that the atomic law extending the lifespan of Germany's 17 nuclear reactors will be suspended for three months in order to review safety procedures at the reactors in the light of the nuclear emergency in Japan caused by devastating earthquakes and a tsunami.

"We are launching a safety review of all nuclear reactors ... with all reactors in operation since the end of 1980 set to be idled for the period of the [three-month] moratorium," Merkel said.

Merkel's government last year reversed a decision to phase out all nuclear power plants in Germany by 2022, extending the lifespan of older reactors by eight years and more modern reactors by 14 years. This reversal became law January 1 but will now be suspended for three months.

"Safety has absolute priority, everything else is subordinate," Merkel told reporters after a Cabinet meeting this past weekend.

*** Reactor design bases must be reviewed: WANO chairman

Nuclear power plant operators worldwide will have to review the design bases

of their stations in the
wake of the complex events that brought Tokyo Electric Power Co.'s Fukushima I and II nuclear power plants
to a dangerous state over the past few days, Laurent Stricker, chairman of the World Association of Nuclear
Operators, said March 15.

Whether seismic design bases are based on the right assumptions and standards will be a major point
to review, Stricker said in an interview.

WANO's board will meet at the end of this month in Paris to review ongoing assistance to Tokyo Electric
Power Co. and to see what nuclear operators worldwide need to do going forward in light of the Japanese
accident, Stricker said.

Despite progress made in nuclear plant safety since the 1986 Chernobyl accident, which led to the creation
of WANO as an industry mutual-help organization, "we find ourselves with a severe accident," he said.

The design basis of the Japanese plant was "largely" exceeded by the earthquake and subsequent tsunami
that struck the plant site, Stricker said from Atlanta, where he was attending a meeting at WANO's regional
center.

Stricker said WANO member organizations are providing experts, technical support and equipment to Tepco
via the WANO Tokyo Center, one of the organization's four regional centers.

The organization represents operators of 447 nuclear power units in 30 countries.

*** Siemens share in Areva joint venture valued at Eur1.62 billion

An independent expert has set the value of Siemens' 34% stake in Areva NP, its joint venture with France's
Areva SA, at Eur1.62 billion ($2.26 billion), Areva said March 15.

The valuation was done as part of an arbitration procedure. The two companies mandated the expert to
assess the value of the Siemens shareholding, in line with the procedure in their shareholders' agreement
of January 30, 2001.

Siemens in January 2009 announced its decision to sell the stake back to Areva, as provided for in
the shareholders' agreement. The companies have been in arbitration since mid-2009.

The Siemens put was valued on Areva's books at end-2010 at Eur2.09 billion, a value that dated from
2007.

The share price of Areva SA's non-voting certificate of investment has taken a beating since March
14 as the crisis at the Fukushima I and II nuclear power plants has led to doubts about the future of
nuclear power in many countries where the French vendor had hoped to seal new plant and services business.

Areva stock closed March 15 down 8.56% to Eur28.80, after dropping 9.61% the previous day. It is down
24% on the year. Only 4% of Areva's shares are traded publicly; the government and government-affiliated
entities own 85%.

*** Bingaman urges NRC review of nuclear safety procedures

A key lawmaker urged the NRC March 15 to study Japan's still-unfolding nuclear crisis in order to determine if US nuclear plants are vulnerable to similar disasters.

Senator Jeff Bingaman, a New Mexico Democrat who chairs the Energy and Natural Resources Committee, said NRC "has been fairly assiduous in insisting on adequate safety" for US nuclear reactors. But given the earthquake and tsunami-caused crisis at Tokyo Electric Power Co.'s Fukushima I and II nuclear power plants in Japan, Bingaman urged NRC to take a "fresh look" at its safety procedures for US nuclear facilities.

"We will need to understand what failures in design could have contributed to the problems in Japan, whether they could have been prevented, and whether similar design flaws exist in reactors here in this country," Bingaman said in a statement. "I hope that the [NRC] will quickly reach some conclusions about whether the safety precautions and provisions that it has insisted on are adequate for the future."

Bingaman acknowledged that his committee does not have jurisdiction over NRC; that authority is held by the Senate Environment and Public Works Committee. Still, Bingaman said, Japan's nuclear crisis is of great interest to his panel because of the broader implications that it holds for US energy policy.

Bingaman, who has long been a supporter of nuclear power, said the Japanese disaster has not changed his view on the need for a robust nuclear energy program in the US.

"I think nuclear power can be provided in a safe reliable way," he said, adding, "it is possible that we will learn some things from what's happened in Japan that will persuade us to put in place additional precautions."

Bingaman said he might hold a hearing on the implications of the Japanese nuclear disaster on US energy policy.

*** CPS Energy suspends talks with NRG over new South Texas units

CPS Energy has suspended talks with NRG Energy about a prospective agreement to purchase additional power from the planned two-unit, 2,700-MW expansion of the South Texas Project nuclear generating station, the San Antonio municipal utility and NRG said March 15.

CPS has a 7.625% stake in the expansion project and would be entitled to roughly 206 MW of capacity from the planned South Texas-3 and -4. It and NRG have talked about the possibility of purchasing unspecified amounts of power from Nuclear Innovation North America, the 88%-12% joint venture of NRG and Toshiba, respectively, that owns the other 92.375% of the planned units, NRG spokesman David Knox said.

CPS said in a statement that it and NRG agreed March 15 "that until more information is available about the situation in Japan and its impact on the industry worldwide, it makes sense to put our purchase power agreement discussions on hold."

Knox said March 14 that it was too soon to comment on whether the Japanese nuclear crisis at Tokyo
Electric Power Co.'s Fukushima I and II nuclear power plants might affect Tepco's plan to have 449-MW
stake in the new units if the project receives a DOE loan guarantee.

*** State might file suit in court to close Vermont Yankee

Vermont will sue Entergy if necessary to ensure Vermont Yankee closes by March 2012, notwithstanding
the NRC's decision to issue a 20-year license renewal for the unit, Vermont's Governor Peter Shumlin
said March 14.

NRC was expected to issue the license March 16, but that issuance has been delayed because of "the
agency's focus on responding to the Japanese request for assistance" in containing damage at several
nuclear power reactors caused by earthquakes and a tsunami, spokesman Scott Burnell said March 15.

"There are no technical or legal issues preventing the issuance" of the license, Burnell said.

Shumlin, a Democrat, said in an interview that he is encouraged by comments NRC Chairman Gregory Jaczko
made March 10 when the commission voted to dismiss the final challenge to the plant's license renewal.
Jaczko said "there are a variety of permits required for this facility to operate and NRC [license renewal]
is just one piece of it."

"This is good news because they re-affirmed Vermont's authority" to determine Vermont Yankee's future,
Shumlin said.

As president pro tem of the Vermont state Senate, Shumlin last year led the Senate's efforts to deny
the plant a new certificate of public good needed for operation beyond March 2012. Shumlin said March
14 that Entergy signed a legal agreement with Vermont when it bought the unit in 2002, agreeing that
the state has the right to issue or deny this certificate.

The governor said that should Entergy challenge the 2002 agreement on the grounds that it is preempted
by federal law, the state would defend the agreement in federal court.

*** Progress says Crystal River-3 restart delayed due to possible damage

Progress Energy said March 15 that the restart of Crystal River-3 will again be delayed after engineers
discovered suspected damage to the containment building that may have been caused by efforts to repair
a concrete crack that has kept the unit offline for more than a year.

A new so-called concrete delamination, or crack, may have been created as workers attempted to complete
repairs to a crack inside the containment building wall, Progress said in a statement.

The planned restart will be postponed until at least May, the company said, without specifying a new
date.

Crystal River-3 has been out of service since September 2009, when it shut for scheduled refueling

and a planned steam generator replacement. Workers discovered a delamination in the containment wall
after cutting the opening for the steam generator work. A root-cause analysis concluded the delamination
was caused by a redistribution of stress during the process of relaxing cables that give the containment
structure additional strength.

Progress had been tightening those cables when monitoring equipment detected a problem, the company
said. Repair options for the new delamination are being considered, Progress Energy Florida CEO Vincent
Dolan said in the statement.

NRC is following the situation and will decide soon if additional inspectors are needed at the site,
spokesman Roger Hannah said March 15.

*** NRC launches special inspection at GNF Wilmington fuel fabrication plant

NRC sent a three-person special inspection team to Global Nuclear Fuels-America s Wilmington, North
Carolina fuel fabrication facility to investigate an event in which plant operators failed to maintain
required process control over a small quantity of enriched uranium, NRC said in a March 14 statement.

GNF-A reported the event March 2. It occurred in a grinding station in one of the plant s uranium process
lines. NRC said GNF-A found a quantity of uranium dioxide beyond prescribed limits had accumulated in
a filter in the grinding station.

NRC said all the plant s grinders were shut down following that discovery and no other powder accumulation
was found. Other process controls and systems ensured the event posed no danger to plant employees or
the public, NRC said.

The inspection began March 14 and will examine the safety implications of the event and the adequacy
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*** Scana still 'committed' to new nuclear units at Summer plant: Scana president

Despite the nuclear reactor accidents in Japan, Scana remains "committed" to building two new nuclear
units at its Summer plant in South Carolina, "and our intention is to remain on schedule," Kevin Marsh,
president and COO at Scana, said on a press conference call March 15.

The company still expects to receive a combined construction and operating license for the two-unit,
2,234-MW nuclear expansion project from the NRC in late 2011 or early 2012, he said.

No delay is expected in starting operation of the first new unit in 2016 and the second in 2019, Marsh
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Steve Byrne, executive vice president of generation and transmission and COO at SCE&G, said that the
design of Westinghouse's AP1000 reactor, the type to be built at Summer, features a 780,000-gallon "passive
containment cooling tank" above the unit's steel containment vessel that

would use gravity to feed cooling water to the reactor in an emergency. Those cooling tanks would provide three days of emergency cooling, he said, and backup cooling water sources would provide another seven days of emergency cooling.

The Scana and SCE&G executives said the Summer station near Jenkinsville, South Carolina is 135 miles from the coast and 400 feet above sea level. The plant is not located near any known active fault line, they said.

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Until that crisis is over, it is unclear how low the spot price might drop, analysts said. In the short run, "expect increased volatility," one analyst said. Another said some sellers would back away from the market as the price falls, believing the price will bounce back later in the year. Others, however, are likely to continue to lower their offer prices in order to make sales, he said.

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TradeTech's weekly spot price, published March 11, was up $1/lb to $67.75/lb.

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*** US reactor report

Turkey Point-3 is operating at 100% power following an outage to repair the condenser system, Florida Power & Light spokeswoman Veronica Swanson said in a March 15 email. FP&L manually shut down the reactor March 6. The unit reconnected to the grid March 14, Swanson said.

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Contact Us:

| To reach Platts |
| E-mail: support@platts.com |

| North America |
| Tel: 800-PLATTS-8 (toll-free) |
| +1-212-904-3070 (direct) |

| Latin America |
| Tel: + 54-11-4804-1890 |

| Europe & Middle East |
| Tel: +44-20-7176-6111 |

| Asia Pacific |
| Tel: +65-6530-6430 |

Nuclear News Flashes
Tuesday, Mar 15, 2011

[Inside This Issue:]

*** IAEA increasing response to Japan reactors: Amano

The IAEA is increasing its response to ongoing developments at the Fukushima-I-1 reactor in Japan, IAEA Director General Yukima Amano said March 15.

Amano said at the afternoon press briefing that a Fukushima Accident Coordination Team has been formed at the IAEA, which he will head and run with assistance from Deputy Director General Denis Flory.

Following the fire in the spent fuel pool of Fukushima-I-4, also called Fukushima Daiini-4, on March 15, Amano said, "I felt the need to raise the level of response on the part of the IAEA."

Following the release of radiation from the spent fuel pool fire, Amano said, radioactive iodine and cesium had been detected "near Tokyo," Amano said at the briefing.

The IAEA will provide environmental monitoring assistance to Japan and will also help coordination assistance to Japan, he said.

For more stories on the Japan nuclear crisis, see the March 17 issue of Nucleonics Week.

*** Germany to shut seven reactors for safety reviews

German Chancellor Angela Merkel announced March 15 the provisional shutdown for three months of seven nuclear reactors pending a safety review in light of events in Japan.

Merkel had announced the previous day that the atomic law extending the lifespan of Germany's 17 nuclear reactors will be suspended for three months in order to review safety procedures at the reactors in the light of the nuclear emergency in Japan caused by devastating earthquakes and a tsunami.

"We are launching a safety review of all nuclear reactors ... with all reactors in operation since the end of 1980 set to be idled for the period of the [three-month] moratorium," Merkel said.

Merkel's government last year reversed a decision to phase out all nuclear power plants in Germany by 2022, extending the lifespan of older reactors by eight years and more modern reactors by 14 years. This reversal became law January 1 but will now be suspended for three months.

"Safety has absolute priority, everything else is subordinate," Merkel told reporters after a Cabinet meeting this past weekend.

*** Reactor design bases must be reviewed: WANO chairman

Nuclear power plant operators worldwide will have to review the design bases of their stations in the wake of the complex events that brought Tokyo Electric Power Co.'s Fukushima I and II nuclear power plants to a dangerous state over the past few days, Laurent Stricker, chairman of the World Association of Nuclear Operators, said March 15.

Whether seismic design bases are based on the right assumptions and standards will be a major point to review, Stricker said in an interview.

WANO's board will meet at the end of this month in Paris to review ongoing assistance to Tokyo Electric Power Co. and to see what nuclear operators worldwide need to do going forward in light of the Japanese accident, Stricker said.

Despite progress made in nuclear plant safety since the 1986 Chernobyl accident, which led to the creation of WANO as an industry mutual-help organization, "we find ourselves with a severe accident," he said.

The design basis of the Japanese plant was "largely" exceeded by the earthquake and subsequent tsunami that struck the plant site, Stricker said from Atlanta, where he was attending a meeting at WANO's regional center.

Stricker said WANO member organizations are providing experts, technical support and equipment to Tepco via the WANO Tokyo Center, one of the organization's four regional centers.

The organization represents operators of 447 nuclear power units in 30 countries.

*** Siemens share in Areva joint venture valued at Eur1.62 billion

An independent expert has set the value of Siemens' 34% stake in Areva NP, its joint venture with France's Areva SA, at Eur1.62 billion ($2.26 billion), Areva said March 15.

The valuation was done as part of an arbitration procedure. The two companies mandated the expert to assess the value of the Siemens shareholding, in line with the procedure in their shareholders' agreement of January 30, 2001.

Siemens in January 2009 announced its decision to sell the stake back to Areva, as provided for in the shareholders' agreement. The companies have been in arbitration since mid-2009.

The Siemens put was valued on Areva's books at end-2010 at Eur2.09 billion, a value that dated from 2007.

The share price of Areva SA's non-voting certificate of investment has taken a beating since March 14 as the crisis at the Fukushima I and II nuclear power plants has led to doubts about the future of nuclear power in many countries where the French vendor had hoped to seal new plant and services business.

Areva stock closed March 15 down 8.56% to Eur28.80, after dropping 9.61% the previous day. It is down 24% on the year. Only 4% of Areva's shares are traded publicly; the government and government-affiliated entities own 85%.

*** Bingaman urges NRC review of nuclear safety procedures

A key lawmaker urged the NRC March 15 to study Japan's still-unfolding nuclear crisis in order to determine if US nuclear plants are vulnerable to similar disasters.

Senator Jeff Bingaman, a New Mexico Democrat who chairs the Energy and Natural Resources Committee, said NRC "has been fairly assiduous in insisting on adequate safety" for US nuclear reactors. But given the earthquake and tsunami-caused crisis at Tokyo Electric Power Co.'s Fukushima I and II nuclear power plants in Japan, Bingaman urged NRC to take a "fresh look" at its safety procedures for US nuclear facilities.

"We will need to understand what failures in design could have contributed to the problems in Japan, whether they could have been prevented, and whether similar design flaws exist in reactors here in this country," Bingaman said in a statement. "I hope that the [NRC] will quickly reach some conclusions about whether the safety precautions and provisions that it has insisted on are adequate for the future."

Bingaman acknowledged that his committee does not have jurisdiction over NRC; that authority is held by the Senate Environment and Public Works Committee. Still, Bingaman said, Japan's nuclear crisis is of great interest to his panel because of the broader implications that it holds for US energy policy.

Bingaman, who has long been a supporter of nuclear power, said the Japanese disaster has not changed his view on the need for a robust nuclear energy program in the US.

"I think nuclear power can be provided in a safe reliable way," he said, adding, "it is possible that we will learn some things from what's happened in Japan that will persuade us to put in place additional precautions."

Bingaman said he might hold a hearing on the implications of the Japanese nuclear disaster on US energy policy.

*** CPS Energy suspends talks with NRG over new South Texas units

CPS Energy has suspended talks with NRG Energy about a prospective agreement to purchase additional power from the planned two-unit, 2,700-MW expansion of the South Texas Project nuclear generating station, the San Antonio municipal utility and NRG said March 15.

CPS has a 7.625% stake in the expansion project and would be entitled to roughly 206 MW of capacity from the planned South Texas-3 and -4. It and NRG have talked about the possibility of purchasing unspecified amounts of power from Nuclear Innovation North America, the 88%-12% joint venture of NRG and Toshiba, respectively, that owns the other 92.375% of the planned units, NRG spokesman David Knox said.

CPS said in a statement that it and NRG agreed March 15 "that until more information is available about the situation in Japan and its impact on the industry worldwide, it makes sense to put our purchase power agreement discussions on hold."

Knox said March 14 that it was too soon to comment on whether the Japanese nuclear crisis at Tokyo Electric Power Co.'s Fukushima I and II nuclear power plants might affect Tepco's plan to have 449-MW stake in the new units if the project receives a DOE loan guarantee.

*** State might file suit in court to close Vermont Yankee

Vermont will sue Entergy if necessary to ensure Vermont Yankee closes by March 2012, notwithstanding the NRC's decision to issue a 20-year license renewal for the unit, Vermont's Governor Peter Shumlin said March 14.

NRC was expected to issue the license March 16, but that issuance has been delayed because of "the agency's focus on responding to the Japanese request for assistance" in containing damage at several nuclear power reactors caused by earthquakes and a tsunami, spokesman Scott Burnell said March 15.

"There are no technical or legal issues preventing the issuance" of the license, Burnell said.

Shumlin, a Democrat, said in an interview that he is encouraged by comments NRC Chairman Gregory Jaczko made March 10 when the commission voted to dismiss the final challenge to the plant's license renewal. Jaczko said "there are a variety of permits required for this facility to operate and NRC [license renewal] is just one piece of it."

"This is good news because they re-affirmed Vermont's authority" to determine Vermont Yankee's future, Shumlin said.

As president pro tem of the Vermont state Senate, Shumlin last year led the Senate's efforts to deny the plant a new certificate of public good needed for operation beyond March 2012. Shumlin said March 14 that Entergy signed a legal agreement with Vermont when it bought the unit in 2002, agreeing that the state has the right to issue or deny this certificate.

The governor said that should Entergy challenge the 2002 agreement on the grounds that it is preempted by federal law, the state would defend the agreement in federal court.

*** Progress says Crystal River-3 restart delayed due to possible damage

Progress Energy said March 15 that the restart of Crystal River-3 will again be delayed after engineers discovered suspected damage to the containment building that may have been caused by efforts to repair a concrete crack that has kept the unit offline for more than a year.

A new so-called concrete delamination, or crack, may have been created as workers attempted to complete repairs to a crack inside the containment building wall, Progress said in a statement.

The planned restart will be postponed until at least May, the company said, without specifying a new date.

Crystal River-3 has been out of service since September 2009, when it shut for scheduled refueling and a planned steam generator replacement. Workers discovered a delamination in the containment wall after cutting the opening for the steam generator work. A root-cause analysis concluded the delamination was caused by a redistribution of stress during the process of relaxing cables that give the containment structure additional strength.

Progress had been tightening those cables when monitoring equipment detected a problem, the company said. Repair options for the new delamination are being considered, Progress Energy Florida CEO Vincent Dolan said in the statement.

NRC is following the situation and will decide soon if additional inspectors are needed at the site, spokesman Roger Hannah said March 15.

*** NRC launches special inspection at GNF Wilmington fuel fabrication plant

NRC sent a three-person special inspection team to Global Nuclear Fuels-Americaâ€™s Wilmington, North Carolina fuel fabrication facility to investigate an event in which plant operators â€œfailed to maintain required process control over a small quantity of enriched uranium,â€ NRC said in a March 14 statement.

GNF-A reported the event March 2. It occurred in a grinding station in one of the plantâ€™s uranium process lines. NRC said GNF-A found a quantity of uranium dioxide beyond prescribed limits had accumulated in a filter in the grinding station.

NRC said all the plantâ€™s grinders were shut down following that discovery and no other powder accumulation was found. Other process controls and systems â€œensured the event posed no danger to plant employees or the public,â€ NRC said.

The inspection began March 14 and will examine the safety implications of the event and the adequacy of GNF-Aâ€™s corrective actions.

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| To reach Platts |
| E-mail: support@platts.com |

| North America |
| Tel: 800-PLATTS-8 (toll-free) |
| +1-212-904-3070 (direct) |

| Latin America |
| Tel: + 54-11-4804-1890 |

| Europe & Middle East |
| Tel: +44-20-7176-6111 |

| Asia Pacific |
| Tel: +65-6530-6430 |

From: LIA07 Hoc
To: Batkin, Joshua; Borchardt, Bill; Virgilio, Martin; Leeds, Eric; Weber, Michael
Subject: New Briefing Resource for Japan Response!
Date: Tuesday, March 15, 2011 10:19:48 PM

We have decided to add a new briefing resource, a "Go Book", to support your information needs related to the Japan response.
These "Go Books" will be substantially smaller than the current unwieldy briefing book, with tabs for status updates, two-pager, talking points, NRC press releases, and a few other ET identified reference materials. There will also be a tab for you to add whatever miscellaneous information you would like to include.
Status updates and the two-pager will be updated for distribution at 6am and 6pm each day. At those times, other information that is in the Go Books will also be updated.
The plan is for this information to be emailed to someone in your office who can update the book for you. **Please provide the name(s) of who you would like to receive the information for updating the books**. Books will be delivered to your offices tomorrow morning.
Thank you,
Sara

Sara Mroz
Office of Nuclear Security and Incident Response
US Nuclear Regulatory Commission
Sara.mroz@nrc.gov
LIA07.HOC@nrc.gov (Operations Center)

GGGG/18

From:	LIA07 Hoc
To:	Borchardt, Bill; Virgilio, Martin; Weber, Michael; Pace, Patti; Speiser, Herald; Gibbs, Catina; Leeds, Eric; Haney, Catherine; Walker, Dwight; Sheron, Brian; Johnson, Michael
Subject:	Updates for the "Go Books", 2030 EDT, March 16 2011
Date:	Wednesday, March 16, 2011 8:39:54 PM
Attachments:	Talking Points Two Pager.031611.1900EDT.DOCX NRC Status Update 3-16.11--1900pm.pdf Talking Points 8.pdf Press Release 9.pdf TEPCO Press Release 34.pdf TEPCO Press Release 35.pdf TEPCO Press Release 36.pdf TEPCO Press Release 31.pdf TEPCO Press Release 32.pdf TEPCO Press Release 33.pdf ET Chronology 3-16-11 5.39pm.pdf From US Embassy Tokyo 3.16.11.pdf TEPCO Press Release 37.pdf

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Please find attached updated information for the "Go Books" provided earlier today.

The updates include:

- The 1900, 3/16/11 Status Update
- The 19400, 3/16/11 Talking Points Two-Pager
- The latest ET Chronology
- The latest NRC Press Release (11-050)
- The latest NRC OPA Talking Points
- The latest TEPCO Press Releases
- Statement from US Embassy Tokyo re: protective actions for American citizens in Japan

We are working on pulling together a few other items that were requested, including the Chairman's prepared statement for today's hearing and a set of briefing slides. We will send those out once we have them.

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

-Sara

Sara Mroz
Office of Nuclear Security and Incident Response
US Nuclear Regulatory Commission
sara.mroz@nrc.gov
LIA07.HOC@nrc.gov (Operations Center)

GGGG/19

NRC "Talking Points" – Current as of March 16, 2011, 1900 EDT

Reactor Status

- Fukushima Daiichi Units 1 - 6

Unit 1

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- As of 2200 JST (0900 EDT) on March 14, it is reported that sea water is being injected with reported stable cooling
- Containment described as "functional"
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- The spent fuel pool level is unknown
- High radiation levels reduced to 600 μSv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)

Unit 2

- Core damage occurred due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Reactor Core Isolation Cooling (RCIC) has failed
- Hydrogen explosion from overheated fuel-water reaction damaged the reactor building
- Secondary containment: Cut hole to reduce likelihood of hydrogen gas buildup
- Sea water injection restarted with core cooling reported as not stable
- Primary containment is intact.
- High radiation levels reduced to 600 μSv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)
- The spent fuel pool level is unknown. Some water is available as evidenced by steam emanating from hole.

Unit 3

- Core damage due to insufficient cooling water caused by loss of offsite power and onsite diesel generators following the tsunami
- Sea water is being injected with reported stable cooling
- Hydrogen explosion from overheated fuel-water reaction has damaged reactor building (secondary containment)
- Primary containment described as "functional"
- The spent fuel pool level is possibly drained – some evidence of steam.
- High radiation levels reduced to 600 μSv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)

Unit 4

- First fire in the reactor building was a small generator lube oil fire. IAEA reports that fire was put out at 2200 EDT, March 14.
- High radiation levels reduced to 600 μSv/hour (60 mrem/hour) at 0200 EDT on March 15, 2011, at site gate. (Site gate is same for each unit.)
- Second fire began at 1645 EDT, March 15, 2011 in reactor building. Reports indicate that this fire is not yet contained. Fuel reported to be uncovered.
- Radiation level outside Unit 4 reported to be 30R/hour following second fire.
- High radiation dose rates measured between Units 3 and 4, source is suspected to be the partially uncovered Unit 4 spent fuel pool.
- The spent fuel pool's ability to retain water is in doubt, no steam – likely dry.

Unit 5

- The reactor is defueled.
- Spent fuel pool is reported to be heating up.
- A/C power available from Unit 6 diesel generator.

Unit 6

- The reactor is defueled.
- Spent fuel pool is reported to be heating up.
- A/C power available from diesel generator.

Other Japanese Nuclear Sites:

- Fukushima Daini Units 1 - 4: As of 7:15 am on March 15 (Japan), Tepco press release reports reactors in cold shutdown and offsite power available.
- Onagawa Units 1 - 3: shutdown, stable, turbine building basement fire extinguished.
- Kashiwazaki Kariwa Nuclear Power Station (Advanced Reactors): Units 1, 5, 6, 7: normal operation / Units 2 to 4: regular outage

Protective Action Recommendations

- For Fukushima Daiichi site, Japanese national government issued a protective action recommendation that instructed evacuation for local residents within a 20km radius of the site boundary and sheltering in place out to 30km for residents who stayed behind
- Japan has imposed no-fly zone (30km radius, altitude unlimited) over Daiichi plants.
- A RASCAL run at 06:54AM (EDT) on March 16, 2011 for hypothetical combined core based on the following assumptions: Units 2 & 3 each, 33% core melt & no containment; Unit 4, full core offload 100% melt in the Spent Fuel Pool (SFP) with no roof; wind direction from West Northwest blowing out to the ocean. Results: PAG exceeded at 50 miles (80.5 km) with TEDE of 24.0 rem, and CDE thyroid of 130 rem.

Meteorological Conditions:

As of 1100 EDT, March 16, wind direction is from the West and wind speed is between 10-20 mph. This wind direction not expected to change significantly until the next front comes through over the weekend.

General Talking Points

- Based upon the degrading situation at the Daiichi plant, the US NRC recommends that Americans within 50 miles of the Daiichi plant to evacuate the area.
- 6.1 Aftershock near Hamaoka: no damage to reactors
  - 5 reactors: 2 are decommissioned; 1 shutdown; 2 operating
- TEPCO and US Forces in Japan (USFJ) are working together to allocate firefighting and heavy equipment capable of pumping seawater from the ocean into containment.
  - A list of additional equipment to provide for accident mitigation has been developed by NRC and provided to USAID.
- Disaster Assistance Response Team arrived Sunday:
  - 11 NRC staff are in Tokyo with the Ambassador and getting information from Japanese officials.
- NRC continues to develop projections of the accident's progression, dose estimates and Q&As, including those addressing the safety of reactors in operation in the US.
- Government of Japan has accepted US offer to conduct aerial/ground monitoring and also requested potassium iodide tablets. DOE Aerial Measurement Teams are expected to fly over the Daiichi site on March 17 at around 0900 local time (2000 EDT).
- The NRC has been asked to provide recommendations for solutions to the spent fuel pool issues during conference call with NISA and TEPCO.

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OPA

TALKING POINTS

JAPAN NUCLEAR SITUATION

As of 3/16/2011 7:15 p.m. EDT

Update: Addition of bullet on status of SFPs

- Based on calculations performed by NRC experts, we now believe that it is appropriate for U.S. residents within 50 miles of the Fukushima reactors to evacuate. Our recommendation is based on NRC guidelines for public safety that would be used in the United States under similar circumstances.

- Given the results of the monitoring and distance between Japan and Hawaii, Alaska, U.S. Pacific Territories and the U.S. West Coast, the NRC expects the U.S. to avoid any harmful levels of radioactivity. The NRC is aware of various internet postings depicting modeled radiation plumes for the ongoing events at the nuclear power plants in Japan. All of the models the NRC has seen are based on generic assumptions regarding the potential radiation release from the plants and as such are unable to predict actual radiation levels away from the site. The NRC is working closely with our federal partners to monitor radiation releases from the Japanese nuclear power plants.

- The NRC continues to believe, based on all available information, that the type and design of the Japanese reactors, combined with how events have unfolded, will prevent radiation at harmful levels from reaching U.S. territory.

- [Status as of 7:00pm on 3/16] The NRC is closely monitoring the condition of the spent fuel pools at the Japanese nuclear power plants. Our current understanding, which is based on the best available information provided to NRC reactor experts in Japan, is the following:

    - Unit 4 – The SFP is likely dry and the integrity of the spent fuel pool is in question.
    - Units 2 & 3 – Steam is escaping which indicates that boiling is likely occurring in the spent fuel pool. The current water level of the pool is uncertain.
    - Unit 1 – The status of the SFP is unknown.

- In accordance with established protocols, U.S. Customs and Border Protection (CBP) employs several types of radiation detection equipment in its operations at both air and sea ports, and uses this equipment, along with specific operational protocols, to resolve any security or safety risks that are identified with inbound travelers and cargo. Out of an abundance of caution, CBP has issued field guidance reiterating its operational protocols and directing field personnel to specifically monitor maritime and air traffic from Japan. CBP will continue to evaluate the potential risks posed by radiation contamination on inbound travelers and cargo and will adjust its detection and response protocols, in coordination with its interagency partners, as developments warrant.

- The Japanese government has formally asked for U.S. assistance in responding to nuclear power plant cooling issues triggered by an earthquake and tsunami on March 11. The NRC has eleven staff on the ground in Japan as part of the USAID team.

- The NRC is coordinating its actions with other federal agencies as part of the U.S. government response. The NRC's headquarters Operations Center was activated at the beginning of the event and has been monitoring the situation on a 24-hour basis ever since.

- The NRC is always looking to learn information that can be applied to U.S. reactors and we will analyze the information that comes from this incident.

- The NRC is working with other U.S. agencies to monitor radioactive releases from Japan and to predict their path.

- U.S. nuclear power plants are built to withstand environmental hazards, including earthquakes. Even those plants that are located outside of areas with extensive seismic activity are designed for safety in the event of such a natural disaster.

- The NRC requires that safety-significant structures, systems, and components be designed to take into account the most severe natural phenomena historically reported for the site and surrounding area. The NRC then adds a margin for error to account for the limitations on historical data. In other words, U.S. nuclear power plants are designed to be safe based on historical data to predict the area's maximum credible earthquake.

NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION

Office of Public Affairs Telephone: 301/415-8200
Washington, D.C. 20555-0001
E-mail: opa.resource@nrc.gov Site: www.nrc.gov
Blog: http://public-blog.nrc-gateway.gov

No. 11-050 March 16, 2011

NRC PROVIDES PROTECTIVE ACTION RECOMMENDATIONS BASED ON U.S. GUIDELINES

Under the guidelines for public safety that would be used in the United States under similar circumstances, the NRC believes it is appropriate for U.S. residents within 50 miles of the Fukushima reactors to evacuate.

Among other things, in the United States protective actions recommendations are implemented when projected doses could exceed 1 rem to the body or 5 rem to the thyroid. A rem is a measure of radiation dose. The average American is exposed to approximately 620 millirems, or 0.62 rem, of radiation each year from natural and manmade sources.

In making protective action recommendations, the NRC takes into account a variety of factors that include weather, wind direction and speed, and the status of the problem at the reactors.

Attached are the results of two sets of computer calculations used to support the NRC recommendations.

In response to nuclear emergencies, the NRC works with other U.S. agencies to monitor radioactive releases and predict their path. All the available information continues to indicate Hawaii, Alaska, the U.S. Territories and the U.S. West Coast are not expected to experience any harmful levels of radioactivity.

###

15 March 2010 02:51am (EDT), NRC Operations Center, Protective Measures Team

This data is based on system condition estimates for a hypothetical, single reactor site, 2350 MWt, Boiling Water Reactor. Model results are projections only and may **not** be representative of an actual release. This projection uses modeled forecast meteorological conditions and is subject to change.

Maximum Dose Values (rem) - Close-In

Dist from release miles (kilometers)	0.5 (0.8)	1. (1.61)	1.5 (2.41)	2. (3.22)	3. (4.83)	5. (8.05)	7. (11.27)	10. (16.09)
Total EDE	5.4E+03	2.0E+03	1.2E+03	8.2E+02	4.8E+02	2.4E+02	1.6E+02	9.5E+01
Thyroid CDE	2.8E+04	1.1E+04	6.2E+03	4.3E+03	2.5E+03	1.3E+03	8.4E+02	5.1E+02
Inhalation CEDE	3.7E+03	1.4E+03	8.0E+02	5.6E+02	3.3E+02	1.7E+02	1.1E+02	6.7E+01
Cloudshine	1.9E+01	9.3E+00	5.8E+00	4.1E+00	2.5E+00	1.4E+00	9.7E-01	6.2E-01
4-day Groundshine	1.7E+03	6.5E+02	3.8E+02	2.6E+02	1.5E+02	7.3E+01	4.6E+01	2.8E+01
Inter Phase 1st Yr	2.4E+04	9.4E+03	5.4E+03	3.8E+03	2.2E+03	1.1E+03	6.6E+02	3.9E+02
Inter Phase 2nd Yr	1.1E+04	4.4E+03	2.6E+03	1.8E+03	1.0E+03	4.9E+02	3.1E+02	1.8E+02

Notes:
- Doses exceeding PAGs are underlined.
- Early-Phase PAGs: TEDE - 1 rem, Thyroid (iodine) CDE - 5 rem
- Intermediate-Phase EPA PAGs: 1st year - 2 rem, 2nd year - 0.5 rem
- *** indicates values less than 1 mrem
- To view all values - use Detailed Results | Numeric Table
- Total EDE = Inhalation CEDE + Cloudshine + 4-Day Groundshine

Maximum Dose Values (rem) - To 50 mi

Dist from release miles (kilometers)	15 (24.1)	20 (32.2)	30 (48.3)	40 (64.4)	50 (80.5)
Total EDE	8.6E+01	6.3E+01	3.7E+01	1.8E+01	8.1E+00
Thyroid CDE	3.3E+02	2.7E+02	1.3E+02	5.9E+01	2.3E+01
Inhalation CEDE	3.9E+01	3.1E+01	1.3E+01	4.4E+00	1.3E+00
Cloudshine	4.5E-01	3.8E-01	1.7E-01	7.4E-02	2.7E-02
4-day Groundshine	4.7E+01	3.2E+01	2.4E+01	1.3E+01	6.7E+00
Inter Phase 1st Yr	7.2E+02	4.8E+02	3.8E+02	2.2E+02	1.3E+02
Inter Phase 2nd Yr	3.4E+02	2.3E+02	1.8E+02	1.1E+02	6.9E+01

Notes:
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- To view all values - use Detailed Results | Numeric Table
- Total EDE = CEDE Inhalation + Cloudshine + 4-Day Groundshine
- Total Acute Bone = Bone Inhalation + Cloudshine + Period Groundshine

16 March 2010 12:24pm (EDT), NRC Operations Center, Protective Measures Team

This data is based on system condition estimates for a hypothetical, four reactor site. Model results are projections only and may **not** be representative of an actual release. This projection uses modeled forecast meteorological conditions and is subject to change.

Maximum Dose Values (rem) - Close-In

Dist from release miles (kilometers)	0.5 (0.8)	1. (1.61)	1.5 (2.41)	2. (3.22)	3. (4.83)	5. (8.05)	7. (11.27)	10. (16.09)
Total EDE	5.4E+03	1.5E+03	6.7E+02	3.9E+02	1.8E+02	7.5E+01	4.0E+01	1.4E+01
Thyroid CDE	2.9E+04	7.9E+03	3.6E+03	2.1E+03	9.6E+02	4.0E+02	2.1E+02	7.5E+01
Inhalation CEDE	3.8E+03	1.0E+03	4.8E+02	2.8E+02	1.3E+02	5.4E+01	2.9E+01	1.0E+01
Cloudshine	2.2E+01	8.0E+00	3.9E+00	2.3E+00	8.0E-01	2.6E-01	2.1E-01	1.1E-01
4-day Groundshine	1.5E+03	4.1E+02	1.9E+02	1.1E+02	5.0E+01	2.1E+01	1.1E+01	4.3E+00
Inter Phase 1st Yr	2.6E+04	7.0E+03	3.2E+03	1.9E+03	8.5E+02	3.6E+02	1.9E+02	7.5E+01
Inter Phase 2nd Yr	1.3E+04	3.5E+03	1.6E+03	9.2E+02	4.2E+02	1.8E+02	9.5E+01	3.8E+01

Notes:
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Cloudshine	1.2E-01	9.7E-02	7.3E-02	7.0E-02	6.6E-02
4-day Groundshine	4.1E+00	3.4E+00	2.8E+00	2.6E+00	2.5E+00
Inter Phase 1st Yr	7.1E+01	6.0E+01	4.7E+01	4.5E+01	4.3E+01
Inter Phase 2nd Yr	3.6E+01	3.0E+01	2.3E+01	2.2E+01	2.1E+01

Notes:
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- Total Acute Bone = Bone Inhalation + Cloudshine + Period Groundshine

T EDE - Total Effective Dose Equivalent
CDE - Committed Dose Equivalent
CEDE - Committed Effective Dose Equivalent
PAGs – Protective Action Guidelines
EPA – Environmental Protection Agency

Press Releases

Press Release (Mar 16,2011)
Wednesday (March 16th): Group 3 (Original Scheduled Time:18:20PM - 22:00PM)

-Blackout Period: Approximately 3 hours (18:20PM - 22:00PM)
-Expected Number of Blackouts: Approximately 2,620,000 customers
-Targeted Region: Saitama pref., Tokyo, Chiba pref., Tochigi Pref., Gunma pref., Yamanashi pref., Kanagawa pref.

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Press Releases

Press Release (Mar 16,2011)
Impact to TEPCO's Facilities due to Tohoku-Taiheiyou-Oki Earthquake (as of 10:00PM)

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

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

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

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

* Unit 1
The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36pm, March 12th. We have started injection of sea water at 8:20 pm and then boric acid into the reactor afterwards.

* Unit 2
At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in article 15, clause 1 occurred (failure of reactor cooling function).
At 5:17 pm, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation.
At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there is a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.
Sea water injection to the reactor is still under operation.

* Unit 3
At 6:50 am, March 14th, while water injection to the reactor was under operation, the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific

Press Releases

Press Release (Mar 16,2011)
Implementation plan of rolling blackout on and after Thurs, March 17, 2011

Due to the power supply-demand balance, TEPCO has been implementing rolling blackout on and after Monday, March 14. We sincerely regret to cause the anxiety and inconvenience to our customers and the society. We appreciate your cooperation in conserving electricity consumption.

○Implementation plan of rolling blackout on Thurs, March 17
Regional block and time periods planned to have rolling blackout based on electricity supply-demand today are as follows.The actual extension of blackout for each block are planned to be up to approximately 3 hours each.
For customers who will be subject to rolling blackout, please be prepared for the announced blackout periods. Also for customers who are not subject to blackouts, TEPCO appreciates your continuous cooperation in reducing electricity usage by avoiding using unnecessary lighting and electrical equipment.

[Expected rolling blackout time periods in each region]
Block 5: 6:20 - 10:00
Block 1: 9:20 - 13:00
Block 2: 12:20 - 16:00
Block 5: 13:50 - 17:30
Block 3: 15:20 - 19:00
Block 1: 16:50 - 20:30
Block 4: 18:20 - 22:00

- Please refer to the attachment1 for the detailed region of the blocks. (The website of TEPCO provides information including "Chome". http://www.tepco.co.jp/index-j.html)
- Starting and ending time of blackout periods may slightly differ.
- Depending on supply and demand conditions on the actual days, planned blac kouts may not been carried out. In addition, in case electricity supply and demand exceeds our forecast, we will reconsider the rolling blackout plan and inform you before we implement the revised planned blackouts.
- The blackout may occur in the adjacent areas where the planned blackouts are carried out.

○Implementation plan of rolling blackout from Fri, March 18 to Tue, March 22 Please refer to the attachment2 for the detailed plan.

- Please refer to the attachment1 for the detailed region of the blocks.
- The rolling blackout will be changed every day. Starting and ending time of blackout periods may slightly differ.

•Depending on supply and demand conditions on the actual days, planned blackouts may not been carried out. Also, in case supply and demand exceeds our forecast, we will reconsider planned blackouts and inform you before we implement the new planned blackouts.

[Others]
•In order to prevent fire, please make sure to switch off the electric appliances such as hair drier and to shut down the breaker of distribution board when you leave your house.
•For the customer who has in-house power generation, please secure fuel for generator.

[Improvement for implementing planned blackouts]
•We are basically carrying out the existing plans, but realize that they have problems. We will consider and improve implementation plans from the customers' point of view.

<Reference>
○Prediction of Demand and Supply on March 16
Estimated Demand 35,000 MW(18:00~19:00)
Supply Capacity 33,000 MW

○Expected demand and supply on March 17
Estimated Demand 38,000 MW(18:00~19:00)
Supply Capacity 33,500 MW

Appendices:

attachment1:Group1(PDF 9.35KB)
:Group2(PDF 10.1KB)
:Group3(PDF 9.81KB)
:Group4(PDF 10.0KB)
:Group5(PDF 12.7KB)
attachment2:Weekly Schedule of Rolling Blackout (planned)(PDF 18.1KB)

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Press Releases

Press Release (Mar 16,2011)
Fire occurrence at Fukushima Daiichi Nuclear Power Station Unit 4

At approximately 5:45 am, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building while transporting a battery to the central control room of Unit 4 of Fukushima Daiichi Nuclear Power Station.
TEPCO immediately reported this incident to the fire department and the local government. In addition, TEPCO also contacted related parties about this incident and began immediate preparations to extinguish the fire.

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Press Releases

Press Release (Mar 16,2011)
Fire occurrence at Fukushima Daiichi Nuclear Power Station Unit 4 (2nd Release)

At approximately 5:45 am, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building while transporting a battery to the central control room of Unit 4 of Fukushima Daiichi Nuclear Power Station.
TEPCO immediately reported this incident to the fire department and the local government. In addition, TEPCO also contacted related parties about this incident and began immediate preparations to extinguish the fire. (previously announced)

However, during an inspection at approximately 6:15 am, TEPCO staff found no signs of fire. The area will be kept under strict surveillance.

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Wednesday, Mar 16, 2011

[Inside This Issue:]

GGGG/20

** SKB submits application for spent fuel repository

** US nuclear industry to conduct review of severe accident response: NEI

** NRC recommends broader evacuation from Japan nuclear disaster: Jaczko

** US reactor report

*** Up to 6 feet of Fukushima cores without water cover

Between one and two meters (two meters is about 6.5 feet) of the fuel cores in reactors 1, 2 and 3
of the Fukushima I nuclear power plant in Japan are not covered by water, IAEA Director General Yukima
Amano said at a press briefing in Vienna March 16.

Amano said the situation at the six-reactor Fukushima I nuclear power station, also known as Fukushima
Daiichi, was very serious and core damage has been confirmed in reactors 1, 2 and 3.

In addition, he said temperatures rises have been observed in the spent fuel pools of reactors 4, 5
and 6 at the site.

Amano said the evacuation of a 20-kilometer (12.4-mile) zone around the plant has been completed and
residents living between 20 km and 30 km of the plant have been advised to take shelter.

Amano said he would fly to Japan as soon as possible to investigate how the agency can help and report
back to the IAEA's board of governors.

He said the IAEA's Fukushima Accident Coordination Team formed March 15 to be sent to Japan will include
nuclear safety and radioprotection experts.

*** Fukushima I-5 reactor core water level drop

The water covering the nuclear fuel core of reactor 5 at the Fukushima I nuclear plant in Japan fell
40 centimeters (15.7 inches) between 7 am and noon Greenwich Mean Time March 15, the IAEA said March
16.

The IAEA did not say why the water level had fallen, but it did say the water level remained above
the top of the fuel assemblies in the core.

The development opens a new front in the battle by Tokyo Electric Power Co. to secure the six-reactor
nuclear plant site against potential meltdowns and radioactive releases.

Until now, no significant problems had been reported at units 5 and 6 at Fukushima I, both of which
were already in cold shutdown when the March 11 earthquake and tsunami struck.

The water is already boiling in the spent fuel pool of unit 4, and Tepco is struggling to maintain
cooling of the reactor cores at units 1, 2 and 3.

IAEA said Wednesday that Japanese authorities informed it that at noon GMT March 15 the water level

in unit 5 had dropped to 201 cm above the top of the fuel. This was a 40 cm decrease since 7 am GMT that
day. Officials at the plant were planning to use an operational diesel generator at unit 6 to supply
water to unit 5.

*** China suspends new plant approval in Fukushima's wake

China, which leads the world in nuclear power expansion, will suspend new nuclear power plant approval,
according to the state-owned Xinhua News Agency.

Xinhua reported March 16 the government has also ordered a "comprehensive safety check" on all operating
nuclear plants and those under construction. It said the decisions were made during a State Council Standing
Committee meeting the same day.

Chinese Premier Wen Jiabao presided over the meeting and was briefed on the situation at Japan's Fukushima
I nuclear power plant, where a meltdown is under way after an earthquake followed by a tsunami cut off
all power supply, Xinhua said.

Officials at the meeting decided to "speed up" the development of a nuclear safety plan and to "suspend
nuclear power projects review and approval, including early site work" until the plan is approved, the
Xinhua report said. It also said that officials at the meeting decided to "adjust and improve" a nuclear
power roadmap for the next few years.

China had planned to launch nuclear energy projects during 2011-2015 that would have a combined generating
capacity of 40,000 MW, according to the government's draft 12th Five-Year Plan. The National People's
Congress China's national parliament met earlier this month to discuss the plan. It is unclear what
the parliament decided after the meeting ended March 14.

China has 10,744 MW of nuclear generating capacity online, according to Platts data. One megawatt equals
0.001 gigawatt. There are 13 nuclear power units, totaling 10.8 GW, operating in China. Twenty-eight
more units, totaling 30.8 GW, are under construction or have received a construction permit, totaling
30.8 GW.

*** Spot price of uranium falls to at least $50/lb

The spot price of uranium continued to fall to at least $50 a pound U3O8 and possibly as low as $47/lb,
several analysts said. According to TradeTech, the spot price March 16 was $50/lb, down $5/lb from the
March 15 price. The spot U3O8 price has dropped by at least $18/lb since the March 11 earthquake and
tsunami hit Japan. The fall in the spot price was accelerated by the announcement by the Chinese government
that new nuclear power plant approvals would be temporarily suspended and that safety inspections of
nuclear power plants under construction would be conducted.

*** ARMZ deal to buy Mantra killed by events in Japan

An A$1.2 billion ($1.17 billion) uranium deal has been canceled in the wake of the nuclear accident unfolding at Japan's Fukushima-I, also called Fukushima Daiichi, nuclear power plant.

Canada's Uranium One said March 16 that a deal by its majority shareholder, Russia's Atomredmetzoloto, to buy Perth, Australia-based Mantra Resources Ltd. will not go forward under the existing agreement.

Uranium One said events in Japan "are likely to have a material adverse effect" on the business, results of operations, assets or liabilities, financial position or prospects of Mantra.

ARMZ considers that the requirements in the December agreement between ARMZ and Mantra could not be satisfied because the agreement requires that there be "no material adverse change" prior to closing the deal, Uranium One said.

Uranium One said ARMZ would explore "alternative approaches" to buying Mantra. Mantra's Mkuju River Project in southern Tanzania has reserves of 39,000 metric tons of uranium, according to ARMZ's December 15 announcement of the deal.

ARMZ was to pay $8 per share representing a 15.5% premium to Mantra's 20-day volume weighted average price on the Australian Stock Exchange at the time of the announcement which put Mantra's value at $1.2 billion of resource.

When the deal closed, Uranium One was to operate and finance Mantra's assets, the companies said at the time.

*** Worst-case Fukushima fallout 'higher than Chernobyl': French expert

The events at Japan's Fukushima I nuclear power plant could potentially lead to higher total radioactive fallout than that from the 1986 Chernobyl accident, the head of France's nuclear safety institute, IRSN, said March 16.

Jacques Repussard said IRSN, along with its US counterparts, has modeled possible radioactive releases under different scenarios of what might happen at the Japanese plant.

He said that in the worst-case scenario, if the six reactor cores and spent fuel pools at Fukushima I, also known as Fukushima Daiichi, cannot be cooled, the releases of radioactive cesium and other radionuclides from "several cores over a longer period" could be "higher than [those from] Chernobyl."

He added that under some accident scenarios, the 20-kilometer evacuation zone and the 30-km sheltering zone ordered around Fukushima I "could be insufficient."

He said Tokyo would be slightly contaminated but that the level of contamination would not pose a problem for human health.

*** Vladivostok radiation level rises slightly

Radiation levels in the Russian Pacific port city of Vladivostok, about 500

miles northwest of Japan's damaged Fukushima I nuclear power plant, rose to 14 microroentgens an hour at 4:00 GMT March 16, from 12 microroentgens the previous day.

The roentgen is a unit of measurement for exposure to ionizing radiation, such as X-ray and gamma rays.

The results follow tests started that day on sea scallops to monitor radiation levels in Russia's Far East, state-run local water firm Primvodokanal said on its web site March 16.

The regional emergencies ministry says up to 30 microroentgens an hour is considered safe, Primvodokanal said.

"If the radiation in the water rises, the health of the molluscs will change as they react to the ions in heavy metal," it said. "So far, this has not happened."

Scientists first started using this method to check for pollution in Russia's Far East waters last year.

The Far East's regional emergencies ministry said in a statement March 16 that it does not see any danger from radiation to the region from the nuclear crisis in Japan, though it is checking radiation levels round-the-clock.

*** French Socialists call for rethinking nuclear, not a phase-out

France's Socialist Party stopped short of calling for a phase-out of nuclear power in a policy laid out in a document circulated March 16 at a parliamentary hearing on Japan's ongoing nuclear accident.

The party said a phase-out was "hypothetical" since some 80% of France's electricity is supplied by its 58 nuclear power units. But it said the country should "sincerely" look for alternatives to nuclear. In the meantime, there should be no nuclear generating capacity added in France, it said.

The party called for immediate safety audits for all French nuclear plants "without waiting for experience feedback from the accidents in Japan." The audits should probe the justification for plant life extension, it said.

The French government has also called for such audits, but Environment Minister Nathalie Kosciusko-Morizet said at the hearing that the audits would be done under criteria to be worked out on an EU level by the EU nuclear regulators' group, Ensreg.

French Green party EELV has called for phasing out nuclear within 25 years. Green Party MP Yves Cochet said at the hearing that goal was "possible." He called for a national debate on nuclear power, followed by a referendum on closing the French reactors.

Nuclear policy is shaping up as an issue in the 2012 presidential and legislative elections.

In the last national elections in 2007, PS candidate Segolene Royal ran on a platform hostile to new nuclear. She lost to Nicolas Sarkozy, who is openly pro-nuclear. This year, Sarkozy is trailing in opinion

polls, but the Socialists are not doing well either and could need the support of the Greens, for whom the nuclear issue is central, to form a coalition.

The far-right National Front's leader Marine Le Pen is running strongly in opinion polls. The party opposes nuclear power.

*** EU nuclear regulators to set 'stress test' criteria

The European Nuclear Safety Regulators Group will meet in April to work out standards and criteria for the planned "stress tests" of European nuclear power plants, French Environment Minister Nathalie Kosciusko-Morizet said March 16.

Kosciusko-Morizet told a French parliamentary hearing on the ongoing accident at Japan's Fukushima I nuclear power plant that the criteria will be used to assess the safety of France's 58 reactors.

Industry Minister Eric Besson said the safety audit would include issues of seismic resistance, flooding, loss of cooling resources and "tools to cope with core melt," such as the "core catcher," or core retention chamber, in Areva's EPR design.

The EU group includes nuclear and radiation safety regulators from all 27 EU member states, some of which, such as Austria, are officially anti-nuclear.

France has 58 reactors, about a third of the EU total, and gets more than 75% of its electricity from nuclear power plants.

A French energy official said it would take time to work out details of the planned "stress tests" and to determine how the nuclear safety audits will be done.

*** Medvedev convinced nuclear power can be safe

Russian President Dmitry Medvedev said March 16 he is convinced nuclear power can be safe, if the location of plant, its design and operator are chosen properly, Russian news agency Itar-Tass reported.

"The construction of new nuclear power stations has arrested great attention, in the wake of the colossal calamity experienced by Japan," he said after talks with Turkish Prime Minister Recep Tayyip Erdogan, with whom he discussed, among other things, Russia's work to build what would become Turkey's first nuclear power plant at Akkuyu.

"Everybody is asking the simple question: Can nuclear power be safe?" the Russian president said, referring to the ongoing accident at the Japanese nuclear power plant Fukushima I.

"With all of these conditions met, nuclear power is absolutely safe and very beneficial to humankind," he said.

For the Akkuyu plant, Russia will used a "fundamentally new control pattern," which includes the "trinity of opportunities" construction of the station, ownership, and its management, Medvedev said.

"This certainly increases our responsibility [and] our Turkish partners are interested in this to a
no small degree," he said.

*** Russia to lend Belarus US$6 billion to build first nuclear plant

Russia will arrange a state loan of "about" $US6 billion to fund Belarusia's first nuclear power plant,
Russian Prime Minister Vladimir Putin told local Russian media March 16.

The loan agreement will be concluded "within a month," he said, according to Itar-Tass.

The two countries signed an agreement to cooperate in the construction of the two-unit, 2,400-MW plant
in Astravets March 15, Russian state nuclear corporation Rosatom said that day. The first unit is to
start commercial operation in 2017 and the second in 2018.

The agreement was signed by Rosatom Director General Sergey Kirienko and Belarusian energy minister
Alexander Ozerets, in the presence of Putin and his Belarusian counterpart Mikhail Myasnikovich.

Myashnikovich said the plant would create a "technological basis" for a common Russian-Belarusian electricity
market, which Kazakhstan might join in the future, Itar-Tass said March 16.

Rosatom subsidiary Atomstroyexport is to be the general contractor of the project.

Kirienko said March 16 that a general agreement on the construction of the plant would be signed in
May.

*** SKB submits application for spent fuel repository

SKB submitted a repository application to the Swedish Radiation Safety Authority and an environmental
court March 16 as the nuclear crisis at Fukushima I in Japan continued unfolding.

"Of course we have considered doing this in the context of what's happened, but I don't think anything
that's happening now in Japan speaks against going ahead with this," Claes Thegerstroem, chief executive
of the Swedish Nuclear Fuel & Waste Management Co., or SKB, said at a press conference March 16.

SKB also submitted an application to build a factory to manufacture the copper and steel canisters
for the spent fuel.

They will review the applications in parallel and make recommendations to the Swedish government, which
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The proposed repository would be built at the Forsmark nuclear plant, while the factory would be near
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The canisters would be placed 500 meters deep in granite bedrock. Bentonite clay would be placed around
them as a buffer against radioactive leaks reaching the atmosphere.

SKB is jointly owned by Sweden's nuclear utilities.

*** US nuclear industry to conduct review of severe accident response: NEI

The US nuclear power industry will take "several actions" to assess its capability to respond to severe accidents like the unfolding disaster at two plants in Fukushima, a senior industry official testified at a March 16 hearing.

Anthony Pietrangelo, senior vice president and chief nuclear officer at the Nuclear Energy Institute, said at the Senate Environment and Public Works hearing that the chief nuclear officers of US nuclear utilities have all agreed to verify "capability to mitigate severe adverse events" at their reactors, "including loss of major safety systems."

NEI said in a March 16 statement that the industry agreed to "verify each company's capability to mitigate conditions that result from severe adverse events, including the loss of significant operational and safety systems due to natural events, fires, aircraft impact and explosions. Specific actions include testing and inspecting equipment required to mitigate these events and verifying that qualifications of operators and support staff required to implement them are current."

Operators will "verify that the capability to mitigate a total loss of electric power to a nuclear power plant is proper and functional. This will require inspections verifying that all required materials are adequate and properly staged and that procedures are implemented," NEI said.

Loss of offsite power and emergency diesel generators crippled safety systems at the Fukushima I reactors after the March 11 earthquake and tsunami, allowing nuclear fuel in the reactors' cores and spent fuel pools to overheat. This overheating led to hydrogen explosions and possibly breaches of containment at some of the reactors, releasing large amounts of radioactivity.

The US operators will "verify the capability to mitigate flooding and the impact of floods on systems inside and outside the plant. Specific actions include verifying required materials and equipment are properly located to protect them from flood," the group said.

NEI said nuclear plant workers will "perform walk downs and inspection of important equipment needed to successfully respond to fire and flood events" and identify the potential that the equipment's function could be lost during seismic events appropriate for the site and develop mitigating strategies for potential vulnerabilities.

"We have no fatalities due to radioactive releases in our country. We're proud of our safety record," Pietrangelo said at the hearing.

The nuclear industry "will apply lessons learned" from the Fukushima events to "make it even less probable" that such accidents will occur in the US, he said.

*** NRC recommends broader evacuation from Japan nuclear disaster: Jaczko

The US Nuclear Regulatory Commission believes it is "appropriate to evacuate to a much larger distance" from the region around the damaged Japanese nuclear power reactors, NRC

Chairman Jaczko said March 16
in testimony before subcommittees of the House Energy and Commerce
Committee.

If a similar accident occurred in the US, Jaczko said, the NRC believes it
would be appropriate to
evacuate "to a much larger radius than has currently been provided in
Japan," Jaczko said in his opening
statement. The US Ambassador in Japan is now informing US citizens there
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to a much larger distance," up to 50 miles from the crippled nuclear power
reactors, he said.

Japanese authorities are evacuating people from a 20-kilometer zone around
the Fukushima nuclear plants.
Those located between 20 and 30 km of the plants are being told to shelter
in place.

"We have indication of radiation levels that would be lethal within a fairly
short period of time.
So they're very significant," Jaczko told the subcommittees at the hearing.
"These very, very high readings"
are "recent developments," he said at the hearing, mid-afternoon US time.

Jaczko did not provide quantitative estimates of the releases or doses
resulting from them, nor did
he say how close to the plant the readings were taken.

The three reactors at the Fukushima I plant, also called Fukushima Daiichi,
that were operating at
the time of the March 11 earthquake are believed to have "suffered some
degree of core damage from insufficient
cooling caused by the loss of offsite power and the inability of emergency
diesel generators to operate
successfully after the tsunami," Jaczko said. He did not provide details on
the extent of the damage.

"Stable cooling" has now been established at Fukushima I-1 and -3 by
flooding the reactor vessels with
seawater, Jaczko said. "The primary containment is described as functional"
for those units, he said.

"We believe core cooling is not stable" at Fukushima I-2, but "believe that
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It is believed that the water level in the unit 2 spent fuel pool is
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may have been interaction of
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At Fukushima I-4, a hydrogen explosion took place "due to uncovering of the
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"Radiation levels are very high" at unit 4, "which could impact the ability
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According to an IAEA report, Jaczko said, the water level is "down a bit" in
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unit 5. There is "no significant information at this time" on unit 6, he
said.

*** US reactor report

The power level at Palisades was reduced to 52% early March 16 so a
planned inspection of electric

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spokesman Mark Savage said in an e-mail. The cables run between a 2,400-volt A/C bus and the 345-kilovolt
bus at the rear of the plant's switchyard, he said. Savage could not say when the plant would return
to full power.

***

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| To reach Platts |
| E-mail: support@platts.com |

| North America |
| Tel: 800-PLATTS-8 (toll-free) |
| +1-212-904-3070 (direct) |

| Latin America |
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| Europe & Middle East |
| Tel: +44-20-7176-6111 |

| Asia Pacific |
| Tel: +65-6530-6430 |

Nuclear News Flashes
Wednesday, Mar 16, 2011

[Inside This Issue:]

*** Up to 6 feet of Fukushima cores without water cover

Between one and two meters (two meters is about 6.5 feet) of the fuel cores in reactors 1, 2 and 3 of the Fukushima I nuclear power plant in Japan are not covered by water, IAEA Director General Yukima Amano said at a press briefing in Vienna March 16.

Amano said the situation at the six-reactor Fukushima I nuclear power station, also known as Fukushima Daiichi, was very serious and core damage has been confirmed in reactors 1, 2 and 3.

In addition, he said temperatures rises have been observed in the spent fuel pools of reactors 4, 5

and 6 at the site.

Amano said the evacuation of a 20-kilometer (12.4-mile) zone around the plant has been completed and residents living between 20 km and 30 km of the plant have been advised to take shelter.

Amano said he would fly to Japan as soon as possible to investigate how the agency can help and report back to the IAEA's board of governors.

He said the IAEA's Fukushima Accident Coordination Team formed March 15 to be sent to Japan will include nuclear safety and radioprotection experts.

*** Fukushima I-5 reactor core water level drop

The water covering the nuclear fuel core of reactor 5 at the Fukushima I nuclear plant in Japan fell 40 centimeters (15.7 inches) between 7 am and noon Greenwich Mean Time March 15, the IAEA said March 16.

The IAEA did not say why the water level had fallen, but it did say the water level remained above the top of the fuel assemblies in the core.

The development opens a new front in the battle by Tokyo Electric Power Co. to secure the six-reactor nuclear plant site against potential meltdowns and radioactive releases.

Until now, no significant problems had been reported at units 5 and 6 at Fukushima I, both of which were already in cold shutdown when the March 11 earthquake and tsunami struck.

The water is already boiling in the spent fuel pool of unit 4, and Tepco is struggling to maintain cooling of the reactor cores at units 1, 2 and 3.

IAEA said Wednesday that Japanese authorities informed it that at noon GMT March 15 the water level in unit 5 had dropped to 201 cm above the top of the fuel. This was a 40 cm decrease since 7 am GMT that day. Officials at the plant were planning to use an operational diesel generator at unit 6 to supply water to unit 5.

*** China suspends new plant approval in Fukushima's wake

China, which leads the world in nuclear power expansion, will suspend new nuclear power plant approval, according to the state-owned Xinhua News Agency.

Xinhua reported March 16 the government has also ordered a "comprehensive safety check" on all operating nuclear plants and those under construction. It said the decisions were made during a State Council Standing Committee meeting the same day.

Chinese Premier Wen Jiabao presided over the meeting and was briefed on the situation at Japan's Fukushima I nuclear power plant, where a meltdown is under way after an earthquake followed by a tsunami cut off all power supply, Xinhua said.

Officials at the meeting decided to "speed up" the development of a nuclear safety plan and to "suspend

nuclear power projects review and approval, including early site work" until the plan is approved, the Xinhua report said. It also said that officials at the meeting decided to "adjust and improve" a nuclear power roadmap for the next few years.

China had planned to launch nuclear energy projects during 2011-2015 that would have a combined generating capacity of 40,000 MW, according to the government's draft 12th Five-Year Plan. The National People's Congress â€" China's national parliament â€" met earlier this month to discuss the plan. It is unclear what the parliament decided after the meeting ended March 14.

China has 10,744.MW of nuclear generating capacity online, according to Platts data. One megawatt equals 0.001 gigawatt. There are 13 nuclear power units, totaling 10.8 GW, operating in China. Twenty-eight more units, totaling 30.8 GW, are under construction or have received a construction permit, totaling 30.8 GW.

*** Spot price of uranium falls to at least $50/lb

The spot price of uranium continued to fall to at least $50 a pound U3O8 and possibly as low as $47/lb, several analysts said. According to TradeTech, the spot price March 16 was $50/lb, down $5/lb from the March 15 price. The spot U3O8 price has dropped by at least $18/lb since the March 11 earthquake and tsunami hit Japan. The fall in the spot price was accelerated by the announcement by the Chinese government that new nuclear power plant approvals would be temporarily suspended and that safety inspections of nuclear power plants under construction would be conducted.

*** ARMZ deal to buy Mantra killed by events in Japan

An A$1.2 billion ($1.17 billion) uranium deal has been canceled in the wake of the nuclear accident unfolding at Japan's Fukushima-I, also called Fukushima Daiichi, nuclear power plant.

Canada's Uranium One said March 16 that a deal by its majority shareholder, Russia's Atomredmetzoloto, to buy Perth, Australia-based Mantra Resources Ltd. will not go forward under the existing agreement.

Uranium One said events in Japan "are likely to have a material adverse effect" on the business, results of operations, assets or liabilities, financial position or prospects of Mantra.

ARMZ considers that the requirements in the December agreement between ARMZ and Mantra could not be satisfied because the agreement requires that there be "no material adverse change" prior to closing the deal, Uranium One said.

Uranium One said ARMZ would explore "alternative approaches" to buying Mantra. Mantra's Mkuju River Project in southern Tanzania has reserves of 39,000 metric tons of uranium, according to ARMZ's December 15 announcement of the deal.

ARMZ was to pay $8 per share â€" representing a 15.5% premium to Mantra's 20-day volume weighted average price on the Australian Stock Exchange at the time of the announcement â€" which put Mantra's value at $1.2 billion of resource.

When the deal closed, Uranium One was to operate and finance Mantra's assets, the companies said at the time.

*** Worst-case Fukushima fallout 'higher than Chernobyl': French expert

The events at Japan's Fukushima I nuclear power plant could potentially lead to higher total radioactive fallout than that from the 1986 Chernobyl accident, the head of France's nuclear safety institute, IRSN, said March 16.

Jacques Repussard said IRSN, along with its US counterparts, has modeled possible radioactive releases under different scenarios of what might happen at the Japanese plant.

He said that in the worst-case scenario, if the six reactor cores and spent fuel pools at Fukushima I, also known as Fukushima Daiichi, cannot be cooled, the releases of radioactive cesium and other radionuclides from "several cores over a longer period" could be "higher than [those from] Chernobyl."

He added that under some accident scenarios, the 20-kilometer evacuation zone and the 30-km sheltering zone ordered around Fukushima I "could be insufficient."

He said Tokyo would be slightly contaminated but that the level of contamination would not pose a problem for human health.

*** Vladivostok radiation level rises slightly

Radiation levels in the Russian Pacific port city of Vladivostok, about 500 miles northwest of Japan's damaged Fukushima I nuclear power plant, rose to 14 microroentgens an hour at 4:00 GMT March 16, from 12 microroentgens the previous day.

The roentgen is a unit of measurement for exposure to ionizing radiation, such as X-ray and gamma rays.

The results follow tests started that day on sea scallops to monitor radiation levels in Russia's Far East, state-run local water firm Primvodokanal said on its web site March 16.

The regional emergencies ministry says up to 30 microroentgens an hour is considered safe, Primvodokanal said.

"If the radiation in the water rises, the health of the molluscs will change as they react to the ions in heavy metal," it said. "So far, this has not happened."

Scientists first started using this method to check for pollution in Russia's Far East waters last year.

The Far East's regional emergencies ministry said in a statement March 16 that it does not see any danger from radiation to the region from the nuclear crisis in Japan, though it is checking radiation levels round-the-clock.

*** French Socialists call for rethinking nuclear, not a phase-out

France's Socialist Party stopped short of calling for a phase-out of nuclear power in a policy laid out in a document circulated March 16 at a parliamentary hearing on Japan's ongoing nuclear accident.

The party said a phase-out was "hypothetical" since some 80% of France's electricity is supplied by its 58 nuclear power units. But it said the country should "sincerely" look for alternatives to nuclear. In the meantime, there should be no nuclear generating capacity added in France, it said.

The party called for immediate safety audits for all French nuclear plants "without waiting for experience feedback from the accidents in Japan." The audits should probe the justification for plant life extension, it said.

The French government has also called for such audits, but Environment Minister Nathalie Kosciusko-Morizet said at the hearing that the audits would be done under criteria to be worked out on an EU level by the EU nuclear regulators' group, Ensreg.

French Green party EELV has called for phasing out nuclear within 25 years. Green Party MP Yves Cochet said at the hearing that goal was "possible." He called for a national debate on nuclear power, followed by a referendum on closing the French reactors.

Nuclear policy is shaping up as an issue in the 2012 presidential and legislative elections.

In the last national elections in 2007, PS candidate Segolene Royal ran on a platform hostile to new nuclear. She lost to Nicolas Sarkozy, who is openly pro-nuclear. This year, Sarkozy is trailing in opinion polls, but the Socialists are not doing well either and could need the support of the Greens, for whom the nuclear issue is central, to form a coalition.

The far-right National Front's leader Marine Le Pen is running strongly in opinion polls. The party opposes nuclear power.

*** EU nuclear regulators to set 'stress test' criteria

The European Nuclear Safety Regulators Group will meet in April to work out standards and criteria for the planned "stress tests" of European nuclear power plants, French Environment Minister Nathalie Kosciusko-Morizet said March 16.

Kosciusko-Morizet told a French parliamentary hearing on the ongoing accident at Japan's Fukushima I nuclear power plant that the criteria will be used to assess the safety of France's 58 reactors.

Industry Minister Eric Besson said the safety audit would include issues of seismic resistance, flooding, loss of cooling resources and "tools to cope with core melt," such as the "core catcher," or core retention chamber, in Areva's EPR design.

The EU group includes nuclear and radiation safety regulators from all 27 EU member states, some of which, such as Austria, are officially anti-nuclear.

France has 58 reactors, about a third of the EU total, and gets more than 75% of its electricity from nuclear power plants.

A French energy official said it would take time to work out details of the planned "stress tests" and to determine how the nuclear safety audits will be done.

*** Medvedev convinced nuclear power can be safe

Russian President Dmitry Medvedev said March 16 he is convinced nuclear power can be safe, if the location of plant, its design and operator are chosen properly, Russian news agency Itar-Tass reported.

"The construction of new nuclear power stations has arrested great attention, in the wake of the colossal calamity experienced by Japan," he said after talks with Turkish Prime Minister Recep Tayyip Erdogan, with whom he discussed, among other things, Russia's work to build what would become Turkey's first nuclear power plant at Akkuyu.

"Everybody is asking the simple question: Can nuclear power be safe?" the Russian president said, referring to the ongoing accident at the Japanese nuclear power plant Fukushima I.

"With all of these conditions met, nuclear power is absolutely safe and very beneficial to humankind," he said.

For the Akkuyu plant, Russia will used a "fundamentally new control pattern," which includes the "trinity of opportunities" â€" construction of the station, ownership, and its management, Medvedev said.

"This certainly increases our responsibility [and] our Turkish partners are interested in this to a no small degree," he said.

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| Tel: +44-20-7176-6111 |

| Asia Pacific |
| Tel: +65-6530-6430 |

From:	NRC Announcement
To:	NRC Announcement
Subject:	General Interest: U.S. House of Representatives Energy and Commerce Committee hearing today, March 16 @ 9:30 AM
Date:	Wednesday, March 16, 2011 9:55:59 AM

NRC Daily Announcements

Highlighted Information and Messages

Wednesday March 16, 2011 -- Headquarters Edition

General Interest: U.S. House of Representatives Energy and Commerce Committee hearing today, March 16 @ 9:30 AM

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Chairman Jaczko and Energy Secretary Chu will be testifying this morning at a joint hearing of two subcommittees of the House Energy and Commerce Committee, scheduled to begin @ 9:30 a.m. This event can be viewed on C-Span 3, which is channel 39 (NRC Broadband) and is expected to be available on the C-Span website. The hearing was originally scheduled to examine the FY2012 budget, but has been expanded to provide an opportunity for Congress to formally receive a status update on the Japanese nuclear facilities damaged by the earthquake and tsunami. There also will be a Senate Environment and Public Works Committee briefing this afternoon at 3:30 p.m. that is expected to be carried on C-Span.

(2011-03-16 00:00:00.0) View item in a new window

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

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Frequently Asked Questions About the NRC Daily Announcements Email

GGGGG/21

From: Leeds, Eric
To: Virgilio, Martin
Cc: Borchardt, Bill; Weber, Michael; Boger, Bruce; Grobe, Jack
Subject: ACTION: NRR taking the lead for commission meeting
Date: Wednesday, March 16, 2011 9:56:24 AM

Marty –

NRR was asked to take the lead for this Commission meeting. In addition, we're also taking the following actions:

1. Establishing a media guru to help facilitate Q&As (beyond the current Share-point site) – Bob Nelson will lead the effort.
2. We've started work on a generic communication to NRC licensees based on the Japanese events. We're following the INPO work.

FYI.

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
301-415-1270

From: Virgilio, Martin
Sent: Wednesday, March 16, 2011 3:29 AM
To: Borchardt, Bill
Cc: Weber, Michael; Leeds, Eric; Dorman, Dan; Miller, Chris; Lewis, Robert; Doane, Margaret; Powell, Amy; Wiggins, Jim; Casto, Chuck; Brenner, Eliot; Muessle, Mary; Andersen, James; Wittick, Brian; Grobe, Jack; Evans, Michele; Ash, Darren
Subject: FW: commission meeting outline.docx

Bill

Last night the Chairman briefed the Commissioners on the status of the events in Japan and NRC's response. During that meeting the Commissioners suggested NRC hold a Commission meeting either this week or next on the events and the Chairman agreed to the meeting.

Attached is a draft outline for that meeting. We believe this outline could also be used as a tool for organizing a presentation for Congressional Briefings and interactions with the media. We acknowledge the ambitious nature of the outline and the fact that we might not be ready to speak to each of the issues if the Commission meeting is held this week.

Marty

GGGG/22

From: Operations Center Bulletin
To: Operations Center Bulletin
Subject: UPDATE: NRC IS RESPONDING TO JAPANESE EVENTS
Date: Wednesday, March 16, 2011 10:41:01 AM

THIS IS NOT A DRILL

The Office of Public Affairs is expecting a large volume of calls from media and the general public regarding the latest statements from the State Department and the NRC regarding the situation in Japan. ALL CALLS from media or the general public on this topic must be referred to the 301-415-8200 number.

The NRC is coordinating its actions with other Federal agencies as part of the U.S. government response to the events in Japan. The NRC is examining all available information as part of the effort to analyze the event and understand its implications both for Japan and the United States. The NRC's Headquarters Operations Center in Rockville, MD has been stood up since the beginning of the emergency in Japan and is operating on a 24-hour basis.

NRC Incident Responders at Headquarters have spoken with the agency's counterpart in Japan and offered the assistance of U.S. technical experts. NRC representatives with expertise on boiling water nuclear reactors have deployed to Japan as part of a U.S. International Agency for International Development (USAID) team. USAID is the Federal government agency primarily responsible for providing assistance to countries recovering from disasters.

U.S. nuclear power plants are built to withstand environmental hazards, including earthquakes and tsunamis. Even those plants that are located outside of areas with extensive seismic activity are designed for safety in the event of such a natural disaster. The NRC requires that safety significant structures, systems, and components be designed to take in account the most severe natural phenomena historically estimated for the site and surrounding area.

The NRC will **not** provide information on the status of Japan's nuclear power plants. For the latest information on NRC actions see the NRC's web site at www.nrc.gov or blog at http://public-blog.nrc-gateway.gov.

Two important reminders:

It is possible that some of us will be requested by colleagues in another country to provide technical advice and assistance during this emergency. It is essential that all such communications be handled through the NRC Operations Center. Any assistance to a foreign government or entity must be coordinated through the NRC Operations Center and the U.S. Department of State (DOS). If you receive such a request, contact the NRC Operations Officer (301-816-5100 or via the NRC Operator) immediately.

If you receive information regarding this or any emergency (foreign or domestic) and you are not certain that the NRC's Incident Response Operations Officer is already aware of that information,

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you should contact the NRC Operations Officer (301-816-5100 or via the NRC Operator) and provide that information.

Other Sources of Information:

USAID – www.usaid.gov
U.S. Department of State – www.state.gov
FEMA – www.fema.gov
White House – www.whitehouse.gov
Nuclear Energy Institute – www.nei.org
International Atomic Energy Agency – www.iaea.org/press

No response to this message is required.

THIS IS NOT A DRILL

From: Dyer, Jim
Sent: Wednesday, April 13, 2011 12:38 PM
To: OST01 HOC
Subject: FW: Fukushima Event Overview from the Japanese Regulator
Attachments: en20110406-1-1.pdf

Can I get a copy for the ET Director Turnover file. jim

-----Original Message-----
From: McDermott, Brian
Sent: Wednesday, April 13, 2011 12:07 PM
To: Dyer, Jim; RST01 Hoc
Subject: FW: Fukushima Event Overview from the Japanese Regulator

FYI

GGGG/24

The 2011 off the Pacific coast of Tohoku Pacific Earthquake and the seismic damage to the NPPs

4th April, 2011

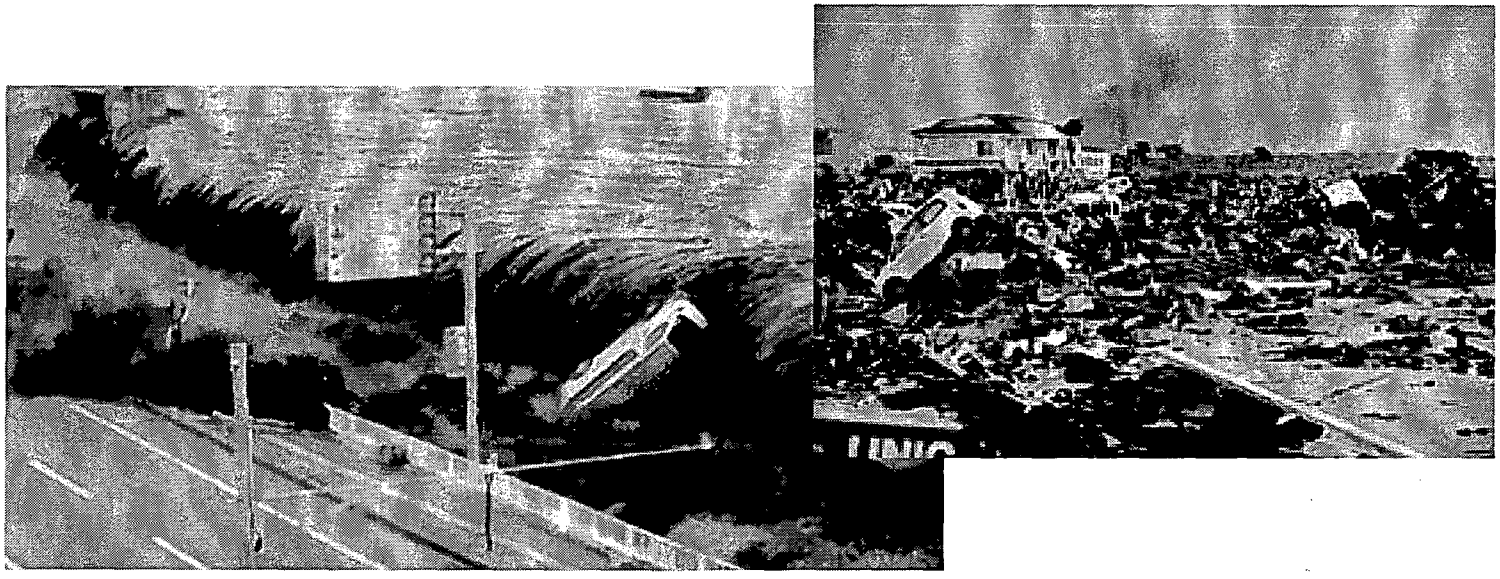
Nuclear and Industrial Safety Agency (NISA)
Japan Nuclear Energy Safety Organization (JNES)

Japan

Contents

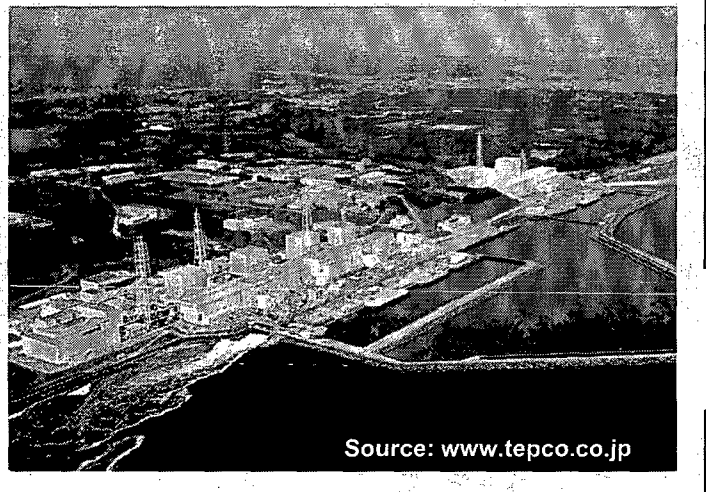
Note: Some date in this material may be incorrect. Especially, all the plant parameters were lost during some period in the accident and some parameters are apparently inconsistent among them.

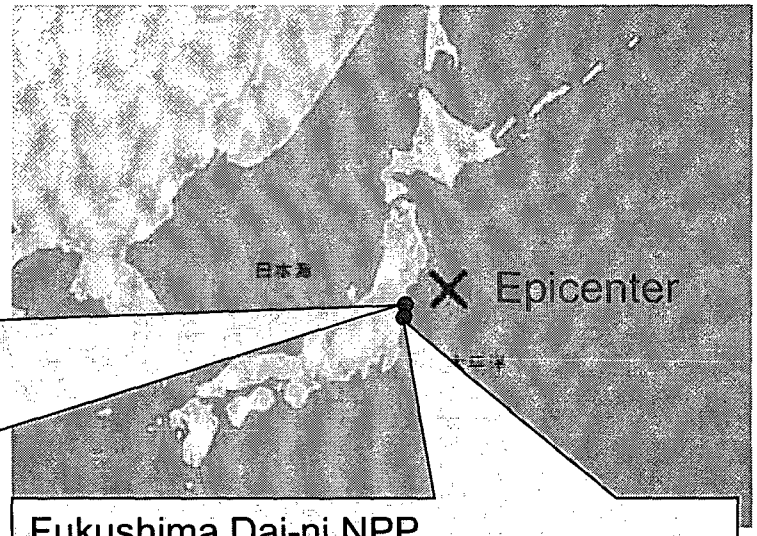
1. Outline of earthquake and nuclear reactors



1-1. 2011 off Tohoku Pacific Earthquake

Fukushima Dai-ichi NPP





Fukushima Dai-ni NPP

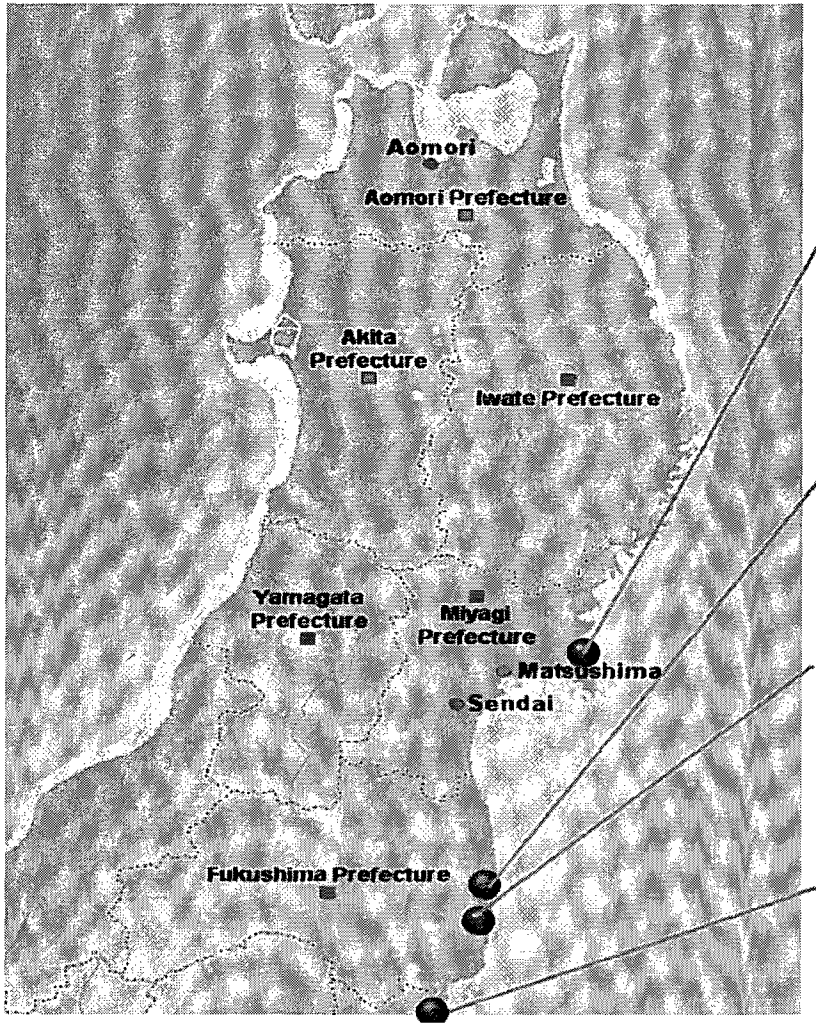
- **Occurred 14:46 March 11, 2011**
- **Magnitude:9.0 Mw**
- **Epicenter location: 38° 6"N and 142° 51"E, and 24km in depth**
- **It is said that the height of tsunami attacked Fukushima NPP was more than 14m**

1-2. Tsunami after the earthquake

- **East coast of northern area in the main island of Japan is seriously damaged**
- **As of April 4, 12,175 people are dead and 15,489 people are missing**

1-3. Nuclear reactors near epicenter of the earthquake

Location of the Nuclear Installations



Onagawa
- Unit1: 524 MW, 1984-
- Unit2: 825 MW, 1995-
- Unit3: 825 MW, 2002-

Fukushima Ⅰ
- Unit1: 460 MW, 1971-
- Unit2: 784 MW, 1974-
- Unit3: 784 MW, 1976-
- Unit4: 784 MW, 1978-
- Unit5: 784 MW, 1978-
- Unit6: 1,100 MW, 1979-

Fukushima Ⅱ
- Unit1: 1,100 MW, 1982-
- Unit2: 1,100 MW, 1984-
- Unit3: 1,100 MW, 1985-
- Unit4: 1,100 MW, 1987-

Tokai Ⅱ (1,100 MW, 1978-)

1-4. Automatic shut-down of nuclear reactors

●11 reactors were automatically shut-down

- Onagawa Unit 1,2,3
- Fukushima Dai-ichi (I) Unit 1,2,3
- Fukushima-Dai-ni (II) Unit 1,2,3,4
- Tokai Dai-ni (II)

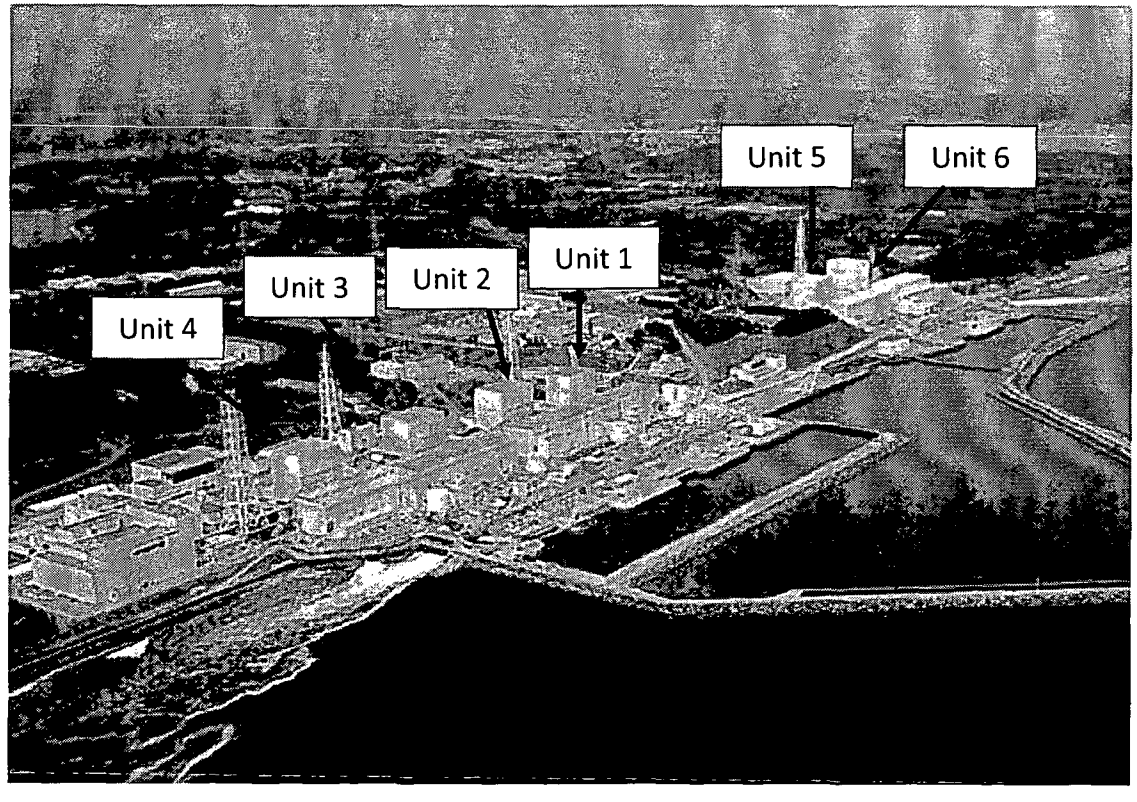
●3 reactors were under periodic inspection

- Fukushima Dai-ichi (I) Unit 4,5,6

-After the automatic shut-down, the Unit 1-3 at Onagawa Nuclear Power Station, the Unit 3 at Fukushima II Nuclear Power Station, and the Unit at Tokai II Nuclear Power Station have been cold shut down safely.

-As for the unit 1,2,4 at Fukushima II Nuclear Power Station, the operator of the station reported NISA nuclear emergency situation because the temperature of the suppression pools became more than 100 ℃, but afterward the three units have been cold shut down.

2. Outline of Fukushima Dai-ichi NPS

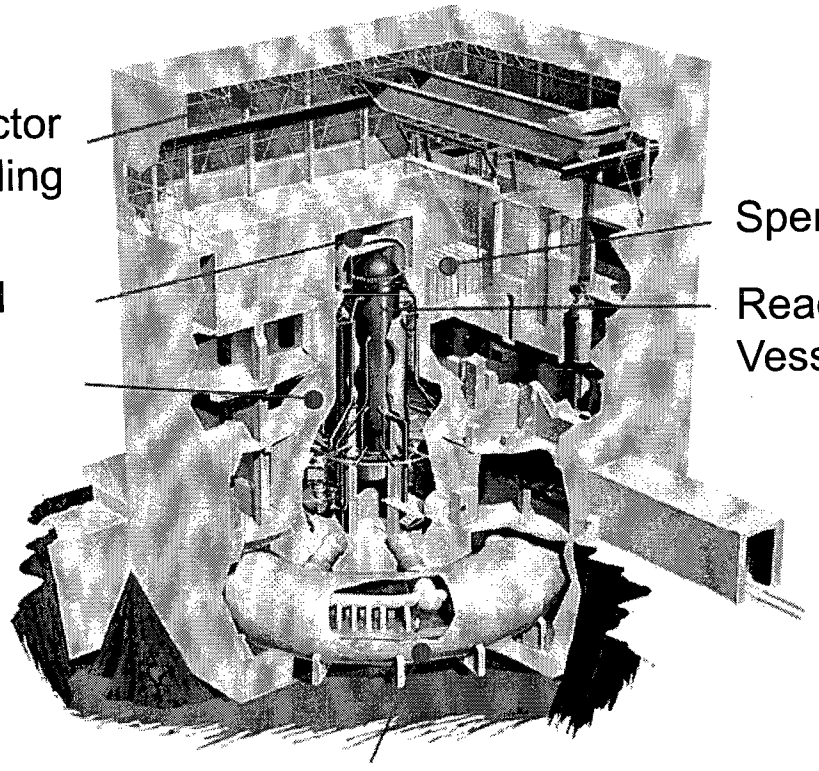


2-1. Summary of Fukushima Dai-ichi NPS

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
	BWR-3	BWR-4	BWR-4	BWR-4	BWR-4	BWR-5
PCV Model	Mark-1	Mark-1	Mark-1	Mark-1	Mark-1	Mark-2
Electric Output (MWe)	460	784	784	784	784	1100
Max. pressure of RPV	8.24MPa	8.24MPa	8.24MPa	8.24MPa	8.62MPa	8.62MPa
Max. Temp of the RPV	300℃	300℃	300℃	300℃	302℃	302℃
Max. Pressure of the CV	0.43MPa	0.38MPa	0.38MPa	0.38MPa	0.38MPa	0.28MPa
Max. Temp of the CV	140℃	140℃	140℃	140℃	138℃	171℃(D/W) 105℃(S/C)
Commercial Operation	1971,3	1974,7	1976,3	1978,10	1978,4	1979,10
Emergency DG	2	2	2	2	2	3*
Electric Grid	275kV × 4				500kV × 2	
Plant Status on Mar. 11	In Operation	In Operation	In Operation	Refueling Outage	Refueling Outage	Refueling Outage

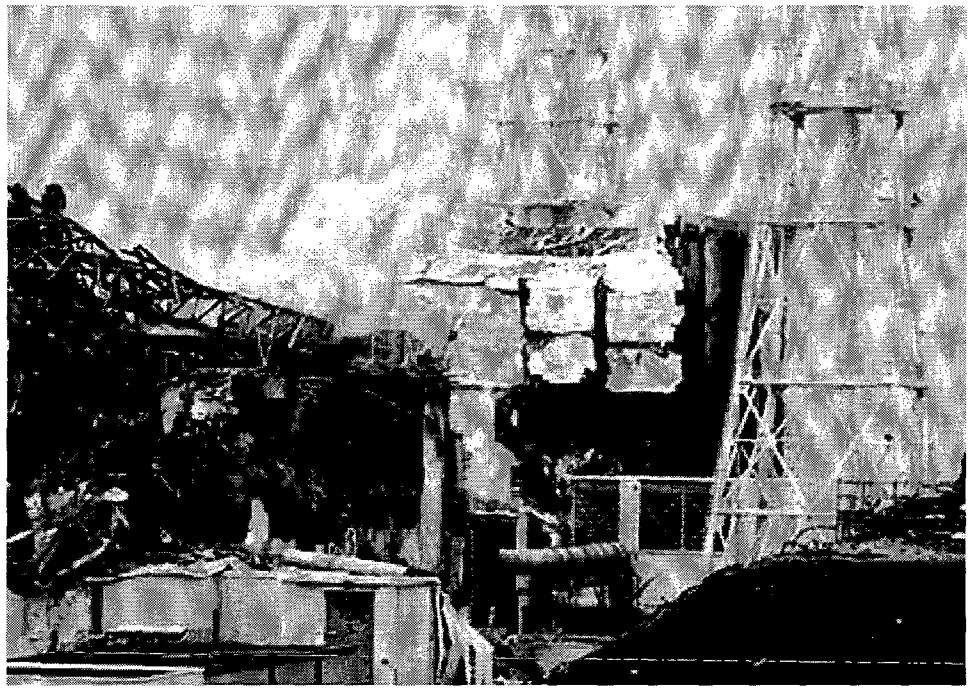
* One Emergency DG is Air-Cooled

2-2. Overview of Mark-1 Type BWR (Unit 1,2,3 and 4)

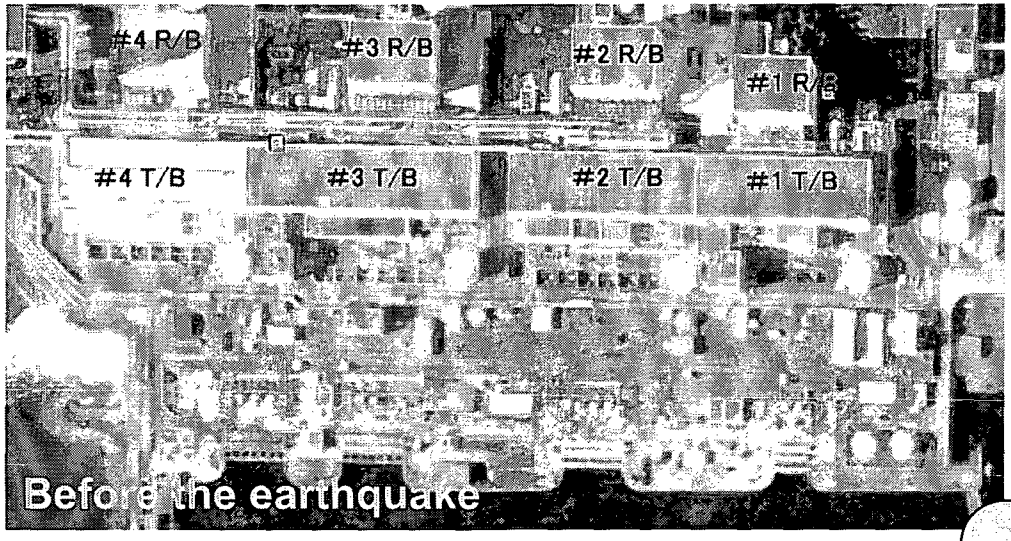


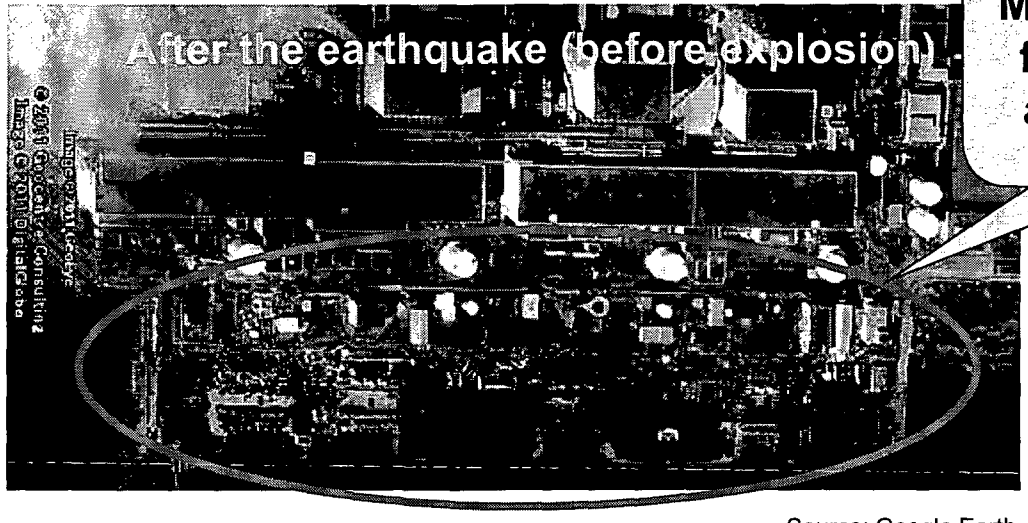
出典：http://nei.cachefly.net/static/images/BWR_illustration.jpg

3. Report concerning incidents at Unit 1 through 6 in the Fukushima Dai-ichi NPS



3-1. Satellite view of Fukushima Dai-ichi NPP



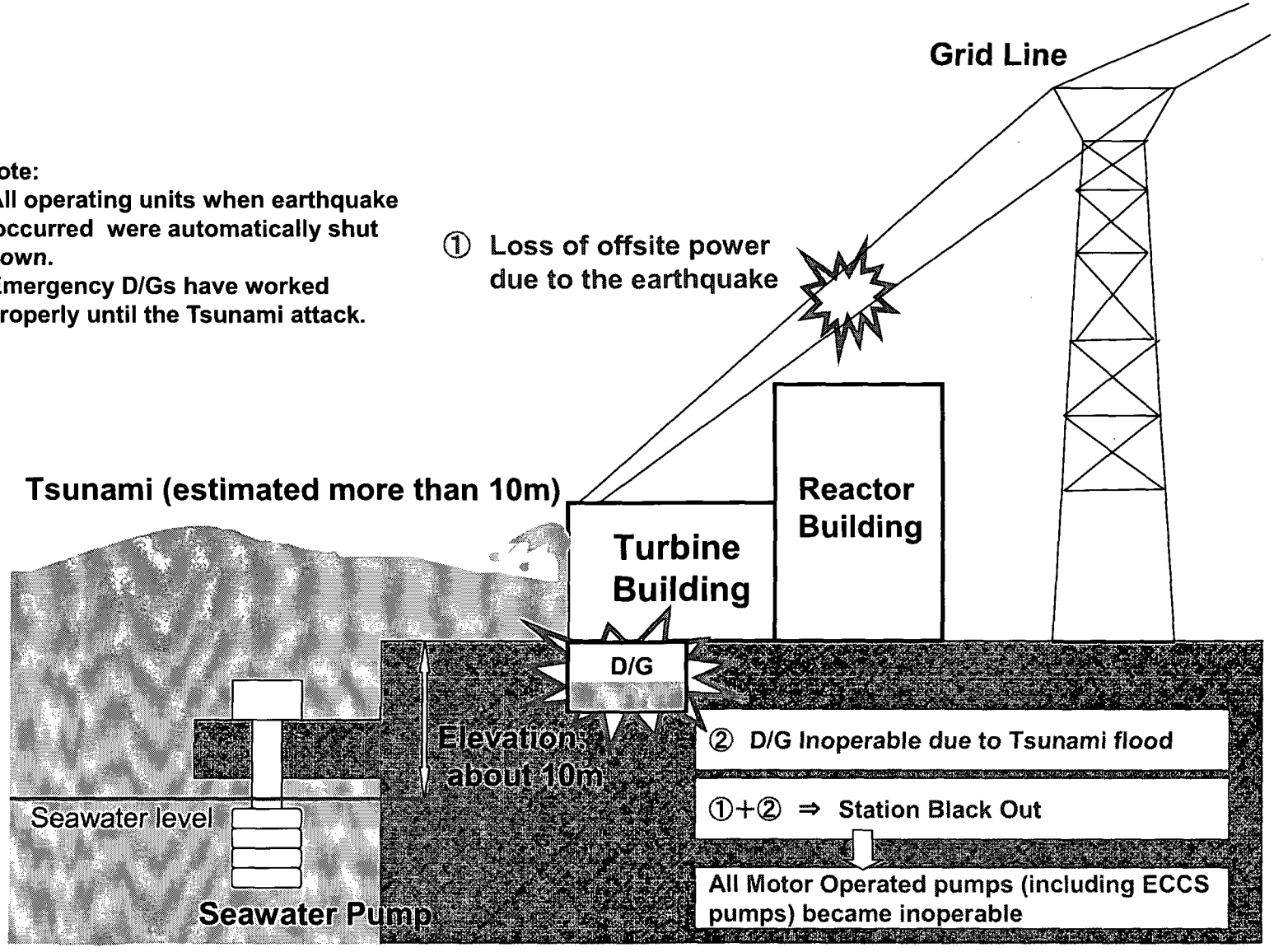


Many structures facing the bay are destroyed

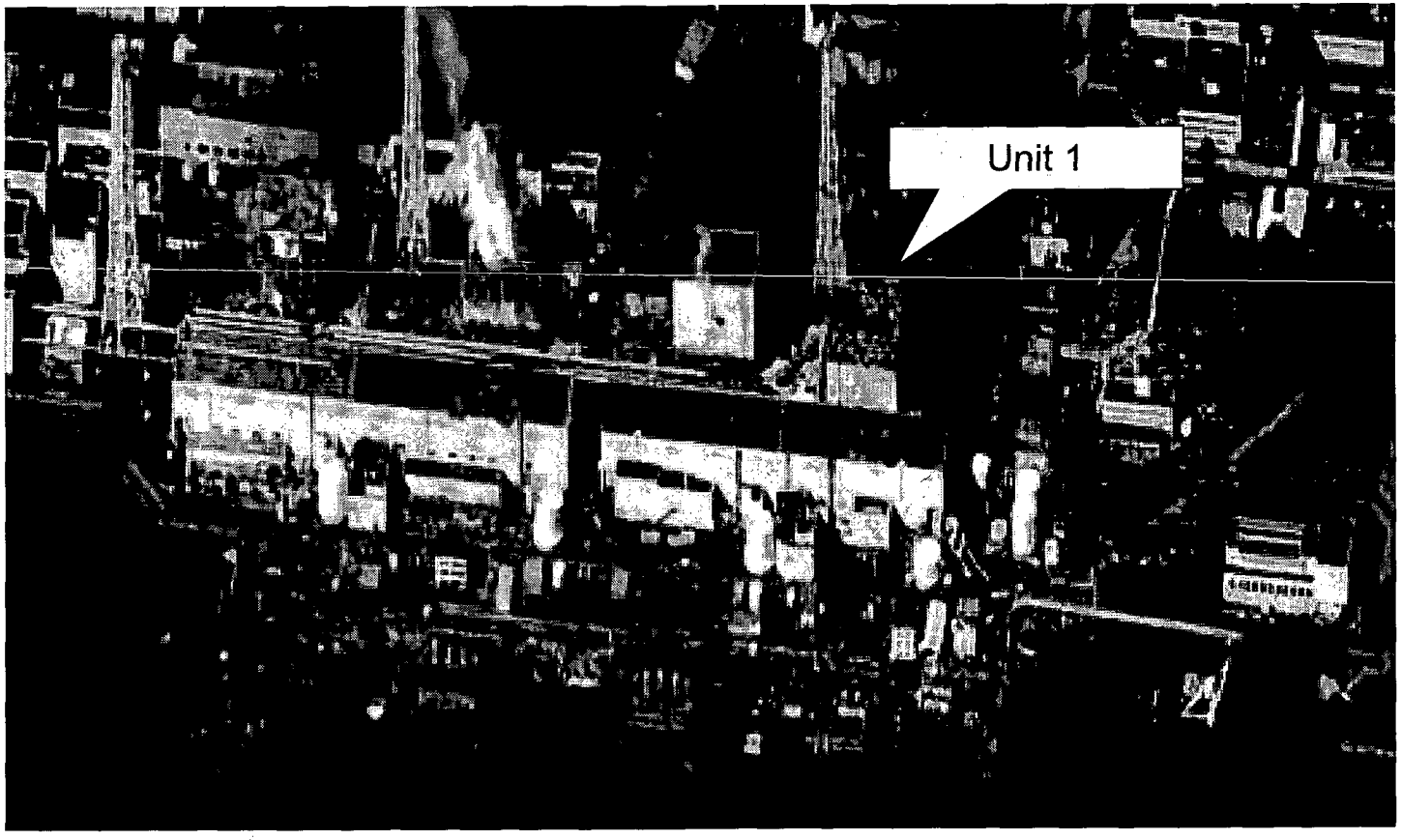
Source: Google Earth

3-2. Major root cause of the damage

Note:
- **All operating units when earthquake occurred were automatically shut down.**
- **Emergency D/Gs have worked properly until the Tsunami attack.**



3-3. Accident Progression at Unit 1 Reactor



3-4. Chronology of Unit 1 after the earthquake

● *Unit 1*

11th
- ●Under operation, Automatic shutdown by the earthquake
- ●Loss of A/C power
- ●Loss of water injection function

12th
- ●Unusual increase of PCV pressure
- ●Started to vent
- ●Sound of explosion
- ●Started of injection of seawater and borated water to the core

22nd
- ●Rise of reactor temperature (383℃) → Drop (26th 05:00 144.3℃)

23rd
- ●Water supply line in addition to the Fire Extinguish line. Switched to water supply line only.(Flow rate: 7m^3/h)

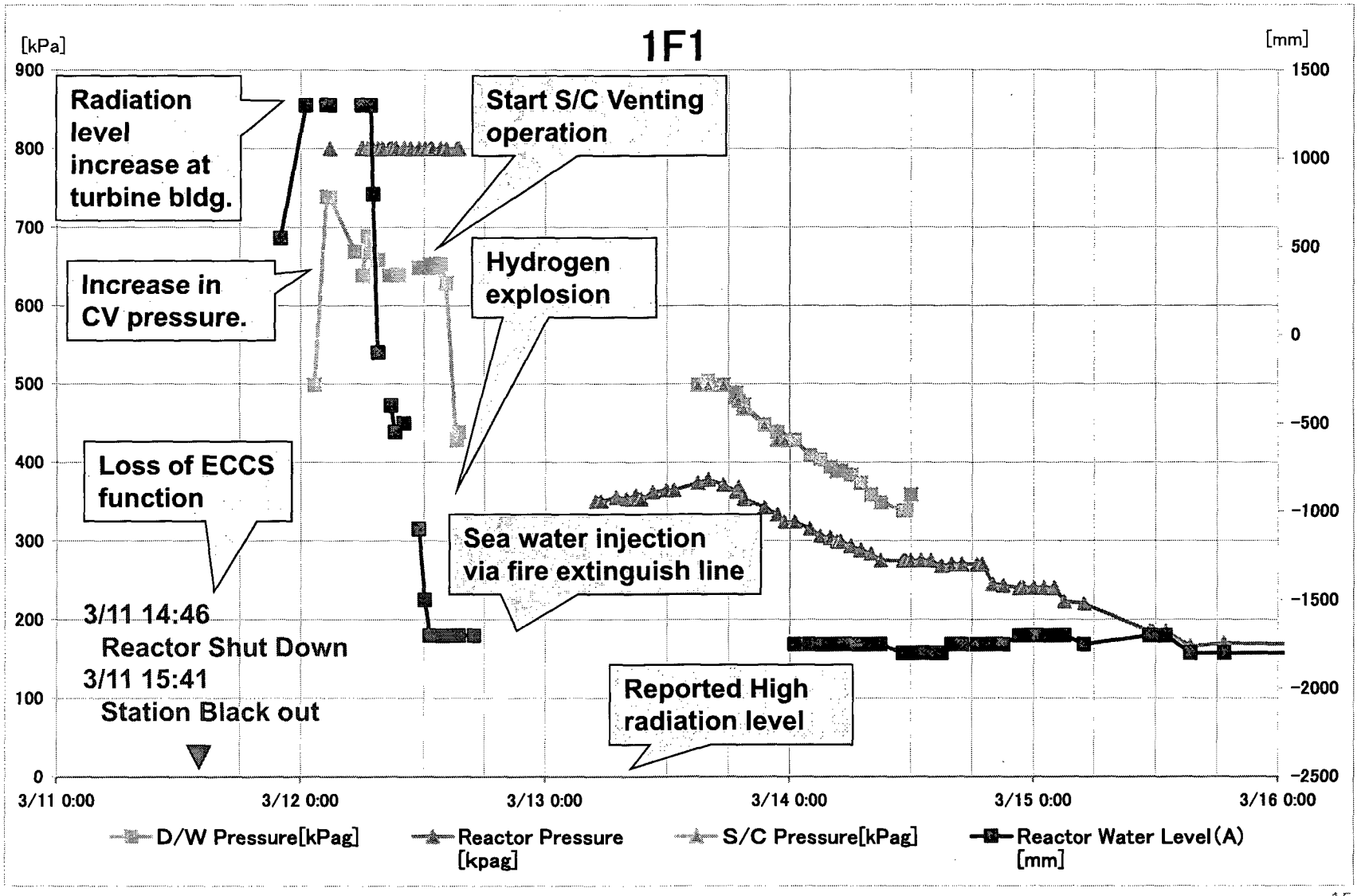
24th
- ●Lighting in the Central Control Room was recovered.

25th
- ●Started fresh water injection

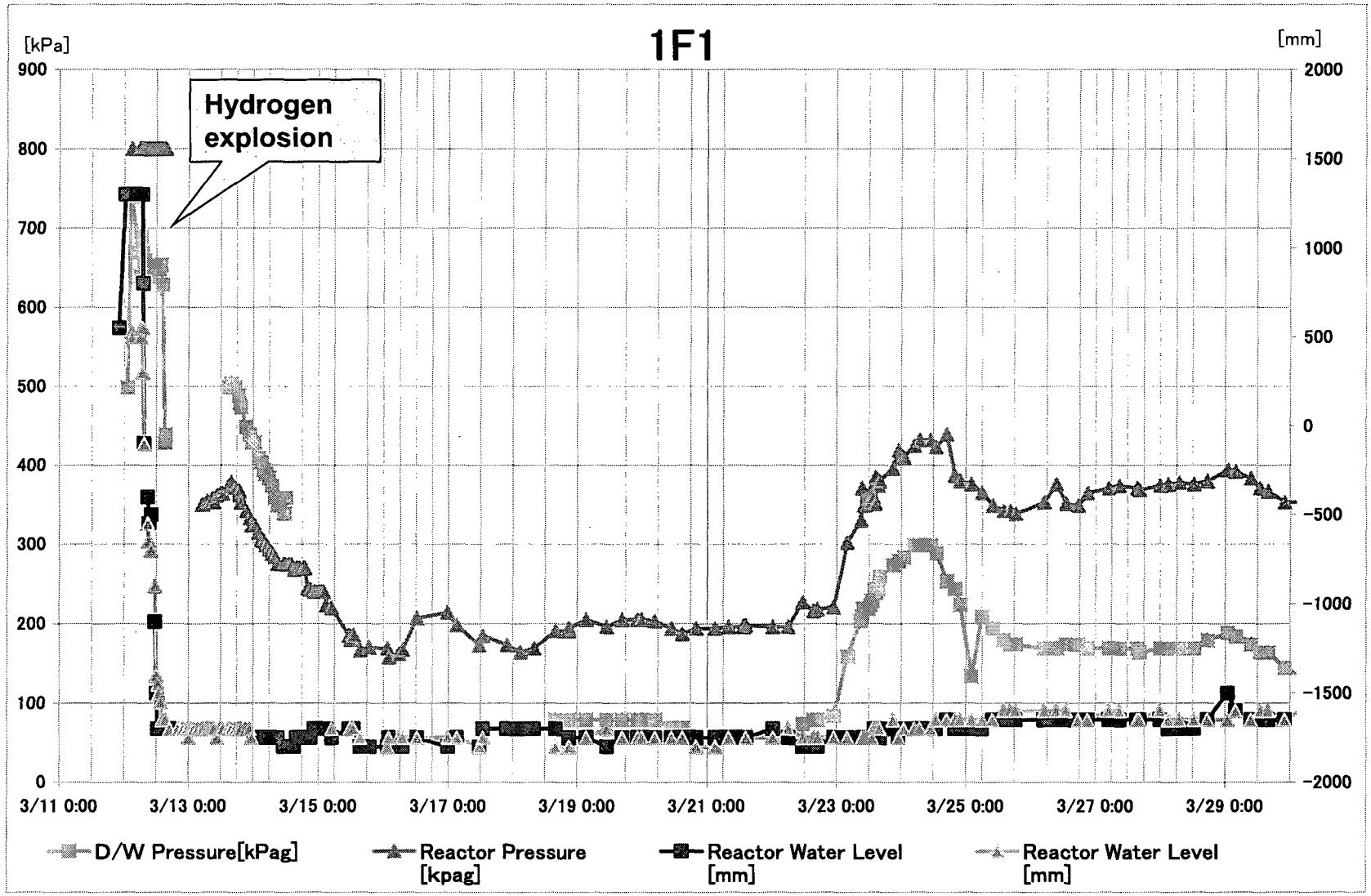
29th
- ●Switched to the water injection to the core using a temporary motor operated pump.

31st
- ●White smoke was confirmed to generate continuously
- ●Freshwater is being injected into the RPV

3-5. Trend data of Unit 1 until March 15

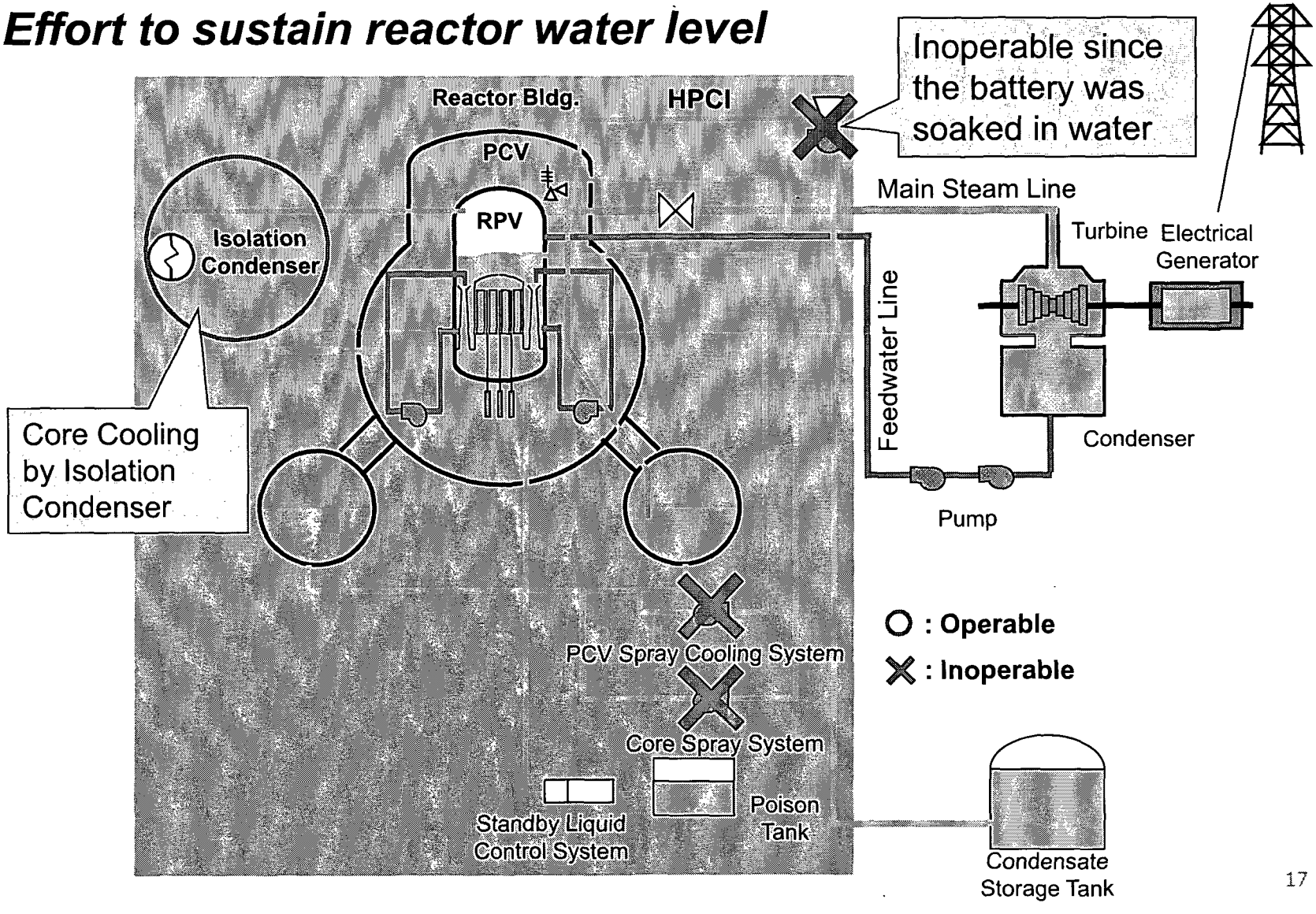


3-6. Trend data of Unit 1 until March 30



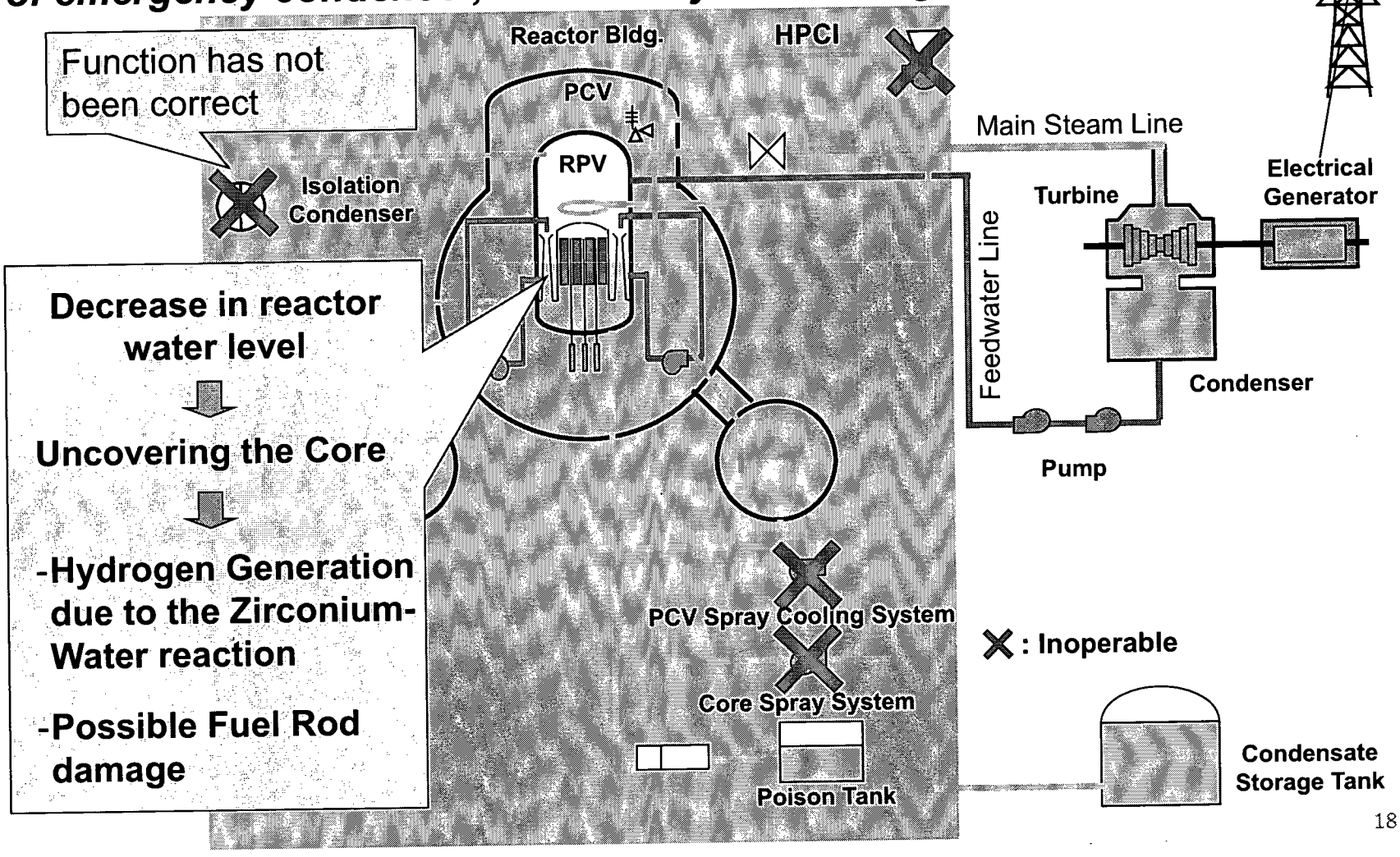
3-7. Major event progression at Unit 1 (1/4)

Effort to sustain reactor water level



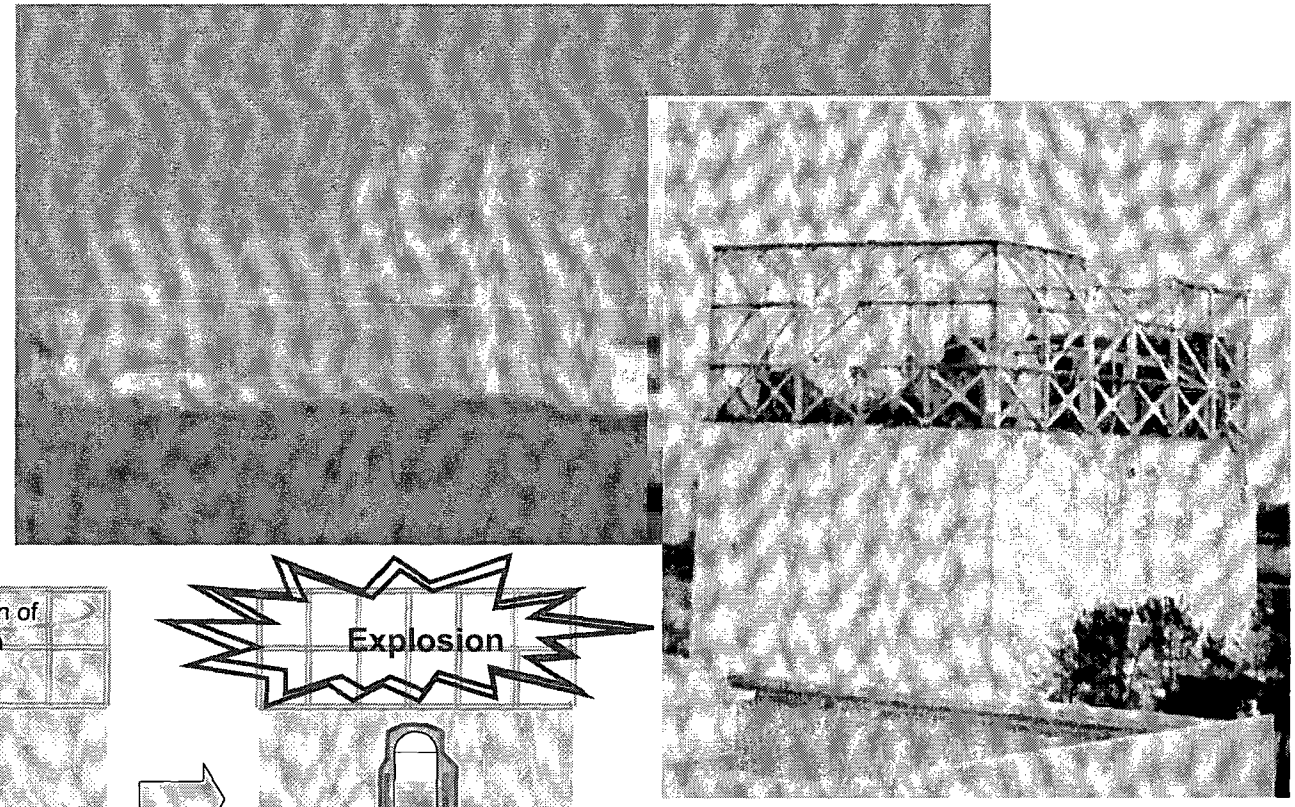
3-7. Major event progression at Unit 1 (2/4)

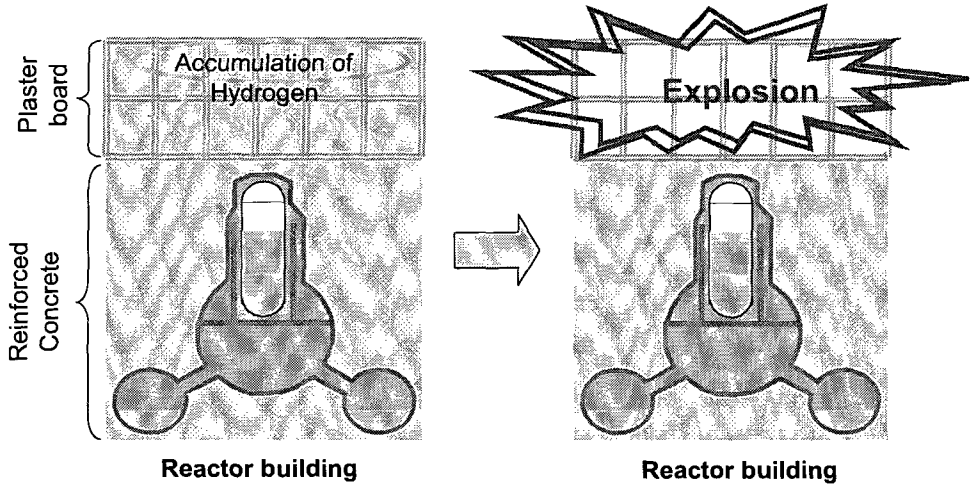
Decrease in reactor water level due to loss of cooling capability of emergency condenser, followed by uncovering the core



3-7. Major event progression at Unit 1 (3/4)

Hydrogen explosion in the operation floor

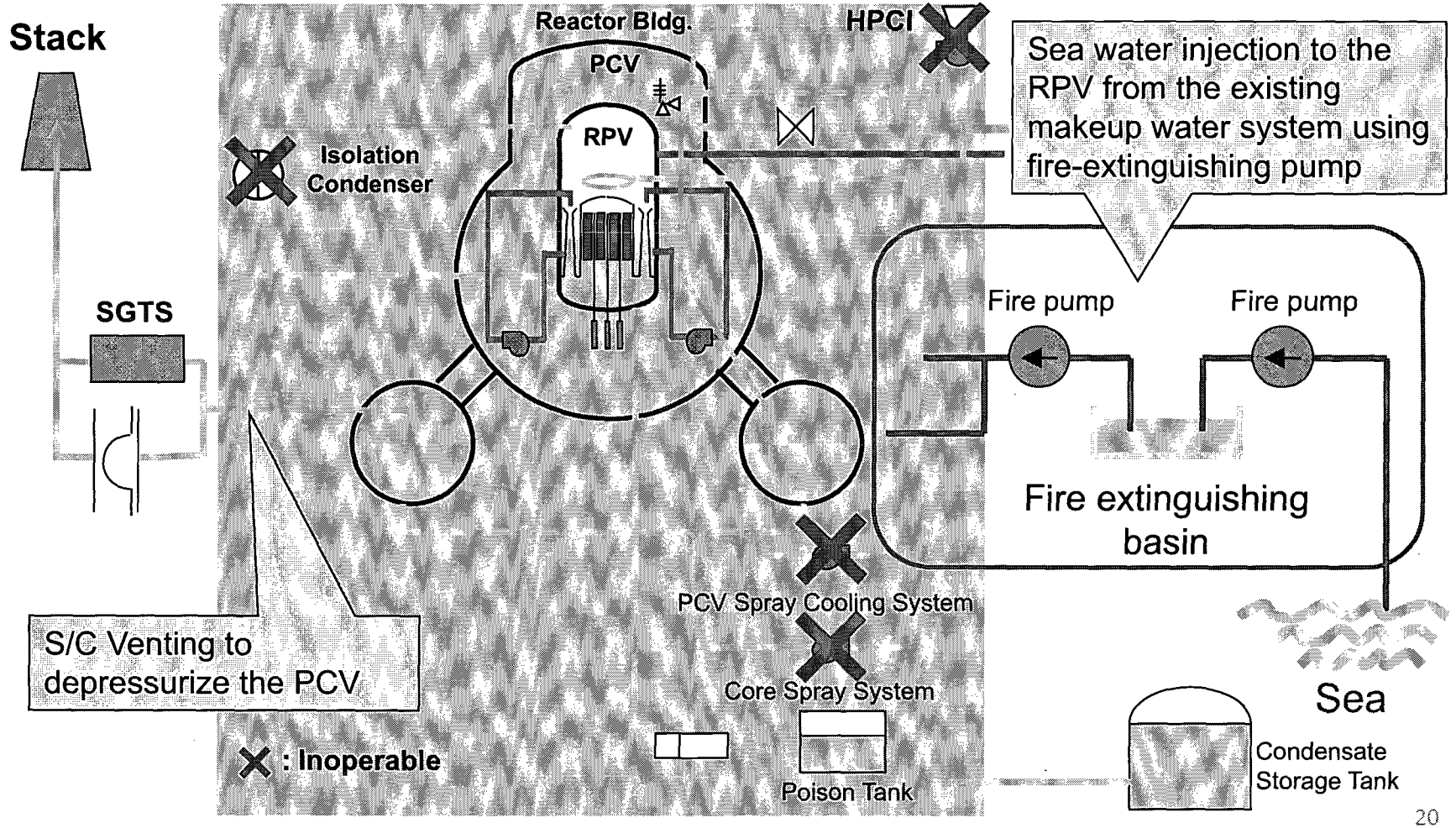




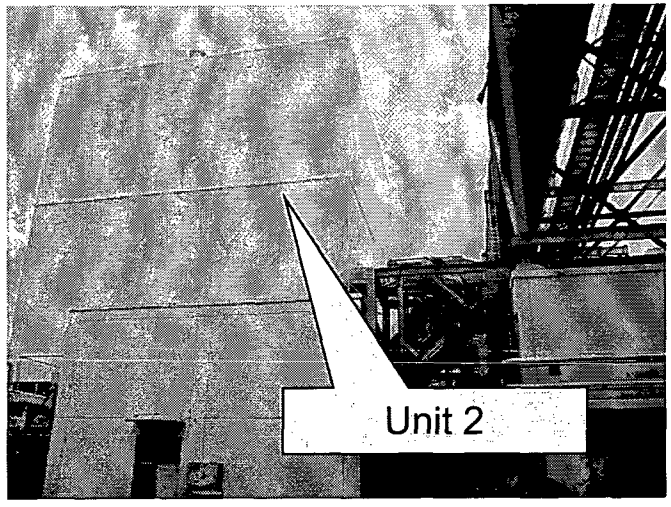
3-7. Major event progression at Unit 1 (4/4)

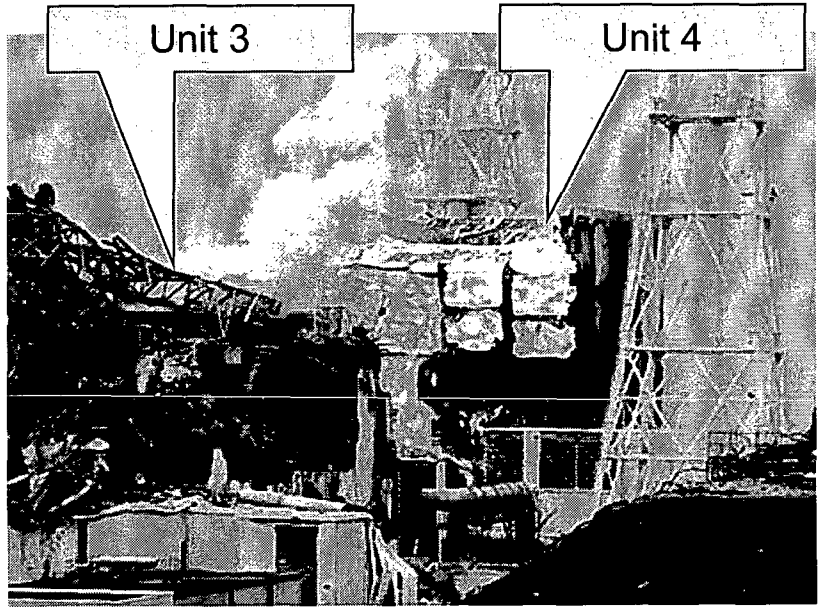
- Sea water injection using fire water pump

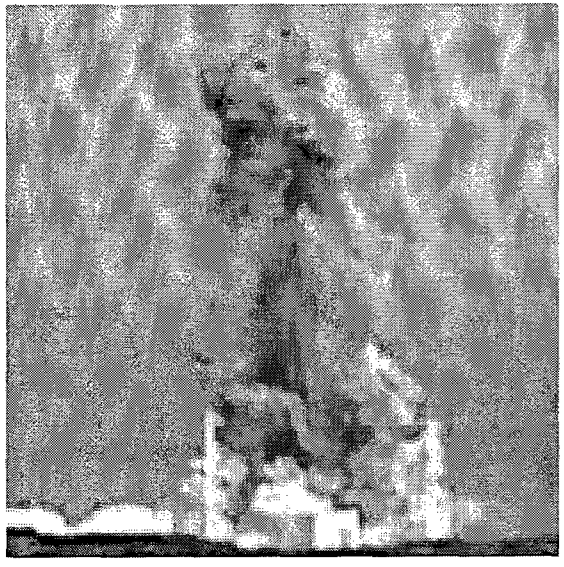
- S/C Venting to depressurize the PCV



3-8. Accident Progression at Unit 2 through 4 reactors







3-9. Chronology of Unit 2 after the earthquake (1/2)

● *Unit 2*

11th
- ●Under operation, Automatic shutdown by the earthquake
- ● Loss of A/C power
- ● Loss of water injection function

14th
- ● Loss of water cooling function
- ● Unusual increase in PCV pressure

15th
- ● Sound of explosion
- ● Possible damage of the suppression chamber

20th
- ● Injection of about 40 tons of seawater into SFP through fire extinguishing system.
- ● Injection of seawater to the Spent Fuel Pool (SFP)

21st
- ● White smoke generated

22nd
- ● Injection of seawater to the Spent Fuel Pool (SFP)

25th
- ● Injection of seawater to SFP

3-9. Chronology of Unit 2 after the earthquake (2/2)

● *Unit 2(Continued)*

26th
- ●Lighting in the Central Control Room was recovered

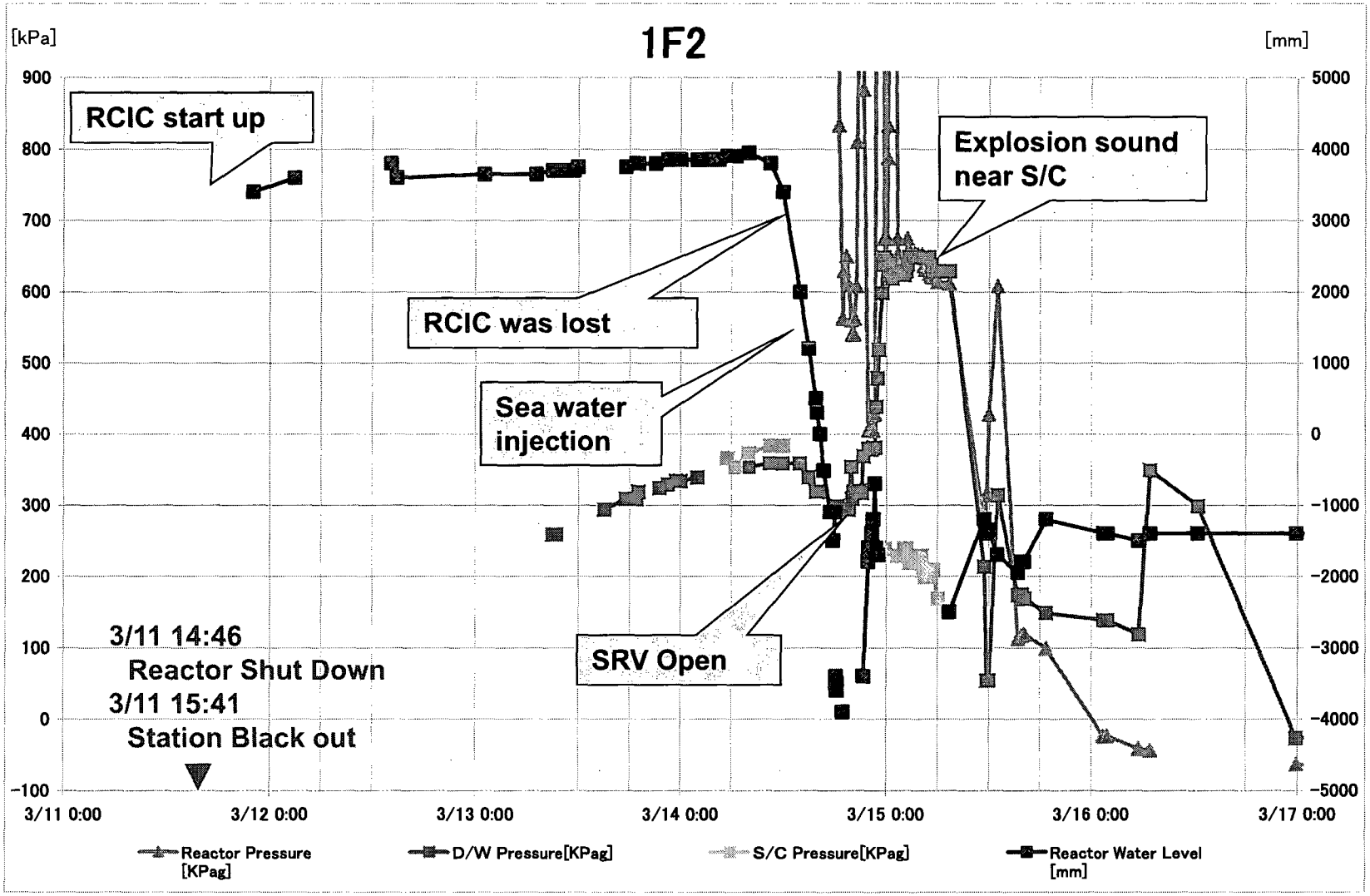
27th
- ●Switched to the water injection to the core using a temporary motor-driven pump.

29th
- ●The Seawater injection to the Spent Fuel Pool using the Fire Pump Truck was switched to the fresh water injection using the temporary motor-driven pump
- ●In order to prepare for transferring the stagnant water on the basement floor of turbine building to the Condenser, the water in the Condensate Storage Tank is being transferred to the Surge Tank of Suppression Pool Water.

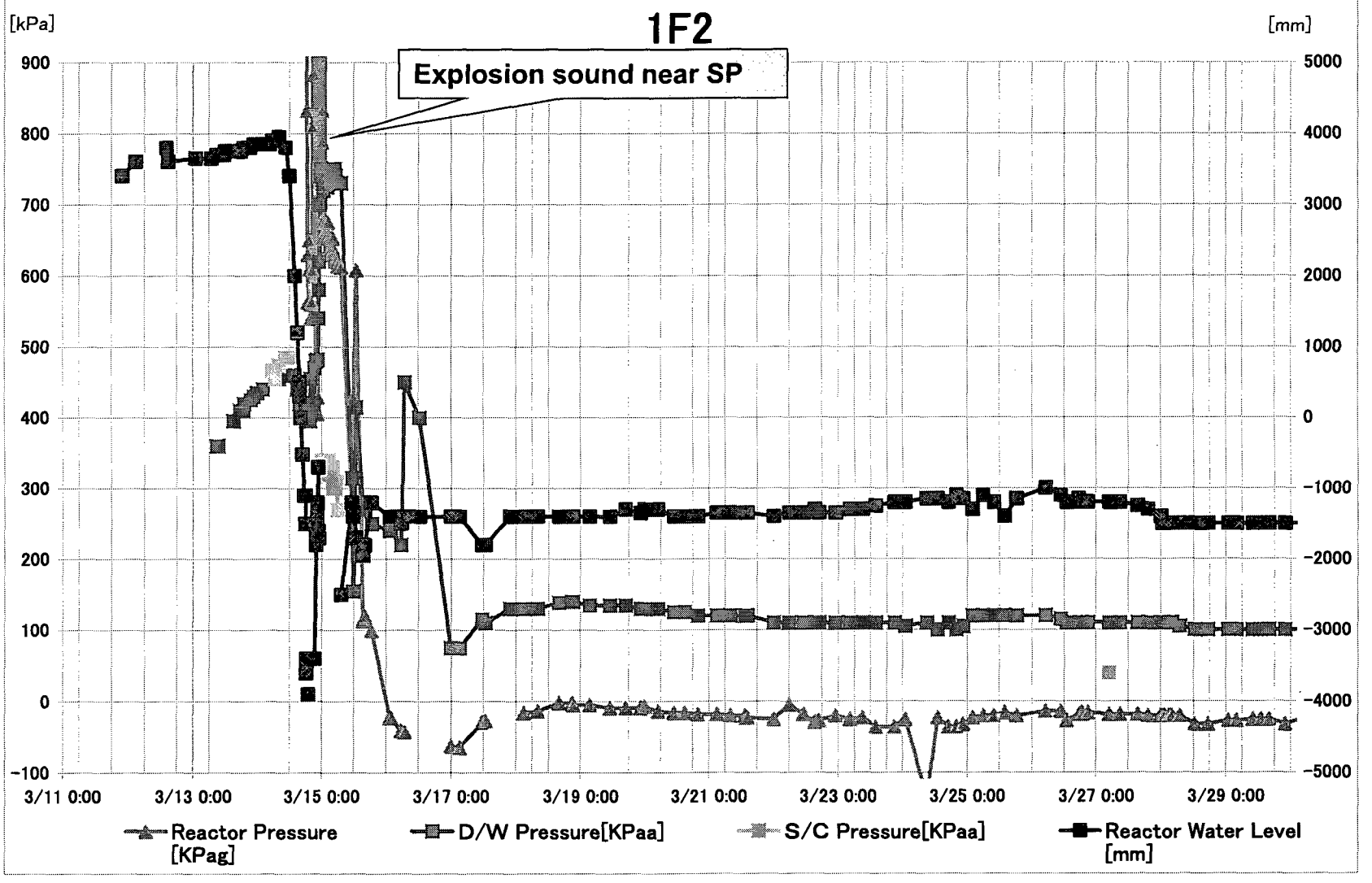
30th
- ●The injection pump was switched to the Fire Pump Truck. However, because cracks were confirmed in the hose (12:47 and 13:10 March 30th), the injection was suspended. The injection of fresh water resumed at 19:05 March 30th.

31st
- ●White smoke was confirmed to generate continuously.
- ●Fresh water is being injected to the spent fuel pool and the RPV

3-10. Trend data of Unit 2 until March 17



3-11. Trend data of Unit 2 until March 30



3-12. Chronology of Unit 3 after the earthquake (1/2)

● *Unit 3*

11th
- ●Under operation, Automatic shutdown by the earthquake
- ● Loss of A/C power

13th
- ● Loss of water injection function
- ● Started to vent

14th
- ●Unusual increase in PCV pressure
- ●Sound of explosion

16th
- ●White smoke generated

17th
- ●Water discharge by the helicopters of Self-Defense Force(4 times)
- ●Water spray from the ground by High pressure water-cannon trucks (Police: once, Self-Defense Force: 5 times)

18th
- ●Water spray from the ground by same trucks (Self-Defense Force: 6 times)

Water spray from the ground by US water-cannon trucks (US armed force:1 time)

19th
- ●Water spray from the ground by High pressure water-cannon trucks by Hyper Rescue Unit of Tokyo Fire Department.

3-12. Chronology of Unit 3 after the earthquake (2/2)

●*Unit 3(Continued)*

20th ●Sprayed by Hyper Rescue Unit of Tokyo Fire Department

22nd ●Lighting in the Central Control Room was recovered.

23rd ●Injection of seawater to the SFP

24th ●Injection of seawater to the SFP

25th ●Water spray (Emergency fire support team
●Started fresh water injection

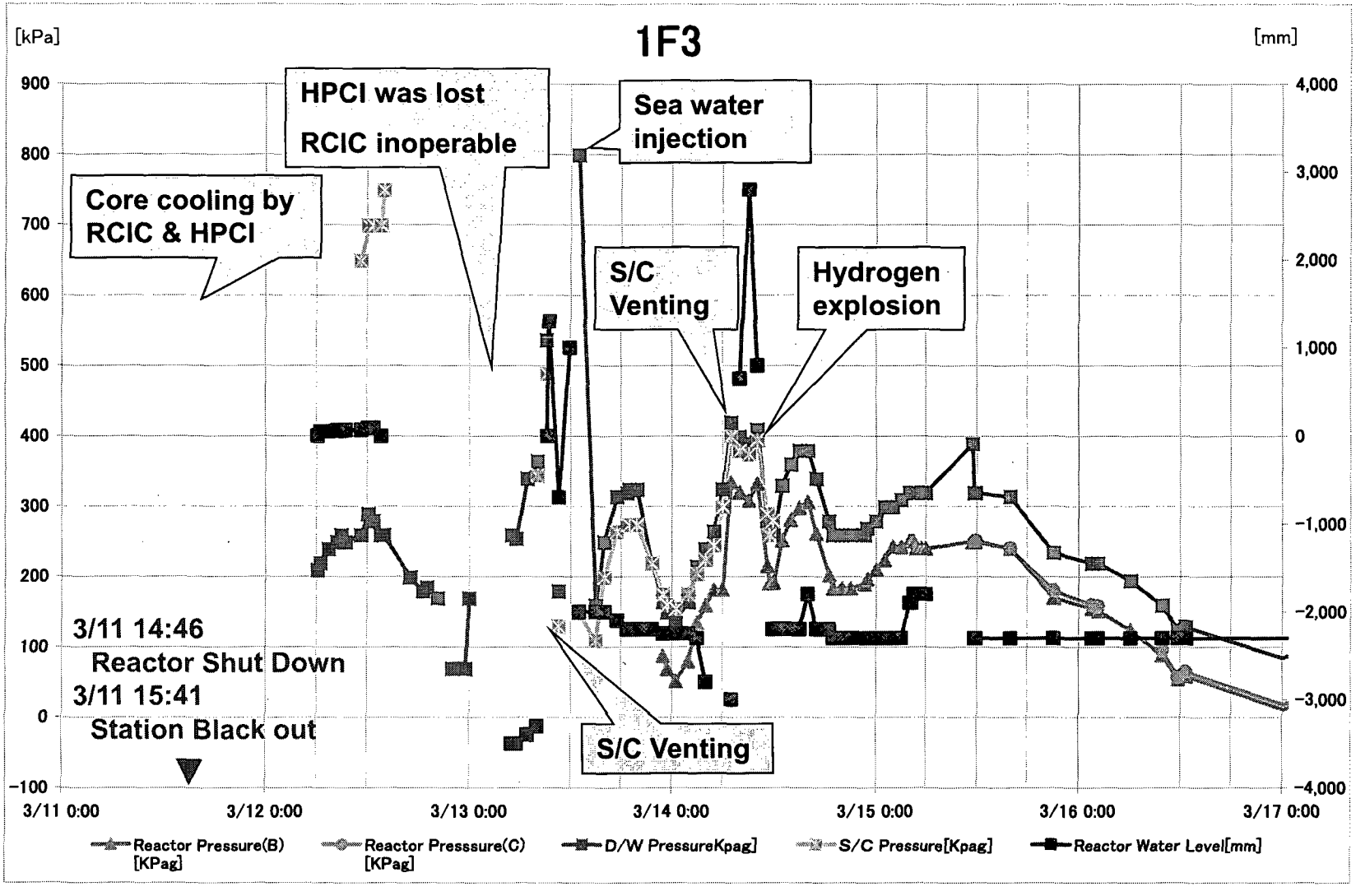
27th ●Water spray by Concrete Pump Truck

28th ●Switched to the water injection to the core using a temporary motor-driven pump
●In order to prepare for transfer the stagnant water on the basement floor of turbine building to the Condenser, the water in the Condensate Storage Tank is being transferred to the Surge Tank of Suppression Pool Water

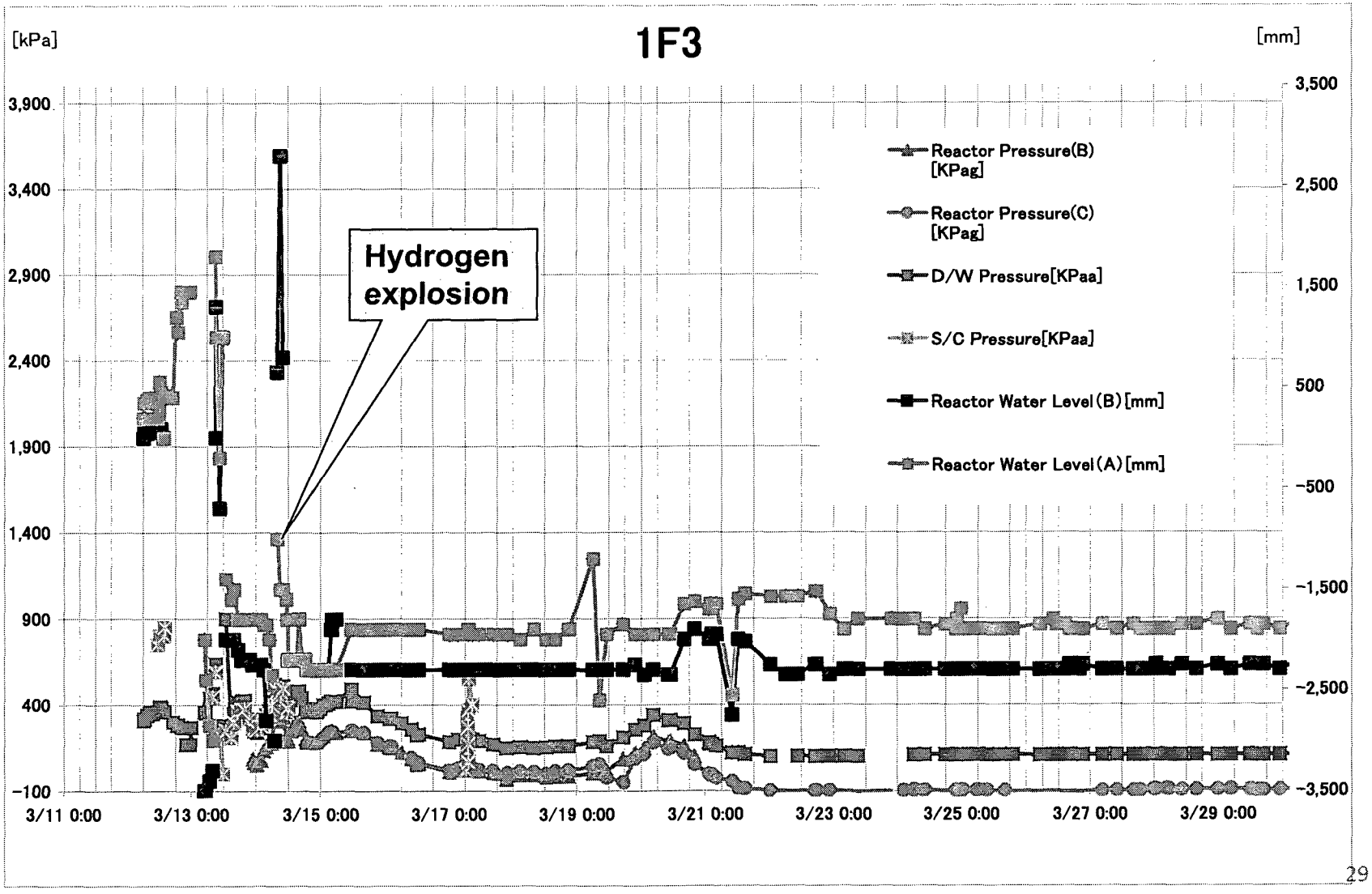
29th ●Started to spray freshwater by Concrete Pump Truck

31st ●White smoke was confirmed to generate continuously
●Fresh water is being injected to the spent fuel pool and the RPV

3-13. Trend data of Unit 3 until March 17

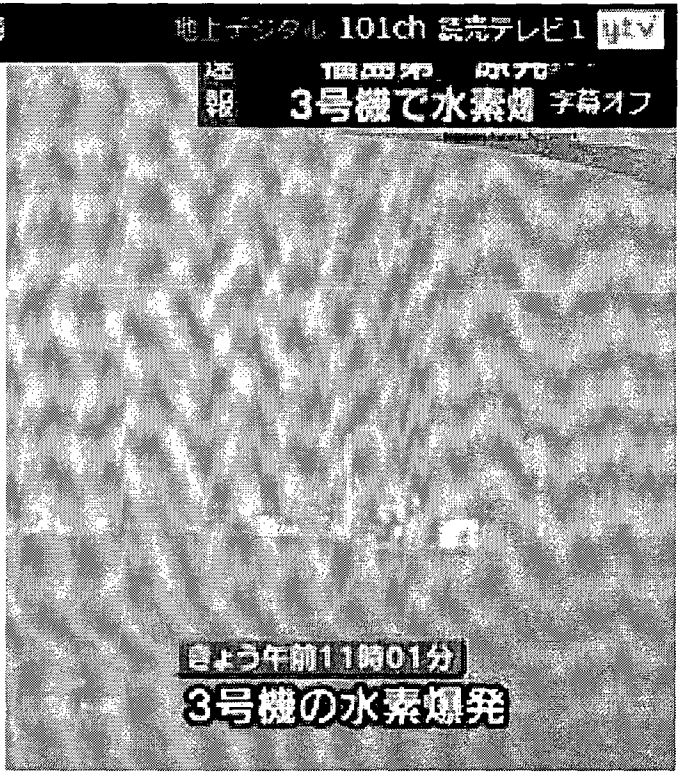


3-14. Trend data of Unit 3 until March 30



3-15. Hydrogen explosion at Unit 1 & 3

Unit 1



Unit 3

3-16. Chronology of Unit 4 after the earthquake

●*Unit 4*

14th	●Water temperature in the Spent Fuel Pool, 84℃
15th	●Damage of wall in the 4th floor confirmed ●Fire occurred in the 3rd floor (12:25 extinguished)
16th	●Fire occurred. TEPCO couldn't confirm any fire on the ground.
20th	●Water spray over the spent fuel pool by Self Defense Force
21st	●Water spray over the spent fuel pool by Self Defense Force
22nd-24th	●Water spray (Concrete Pump Track (3 times)
25th	●Injection of seawater to SFP via the Fuel Pool Cooling Line (FPC) ●Water spray (Concrete Pump Truck)
27th	●Water spray (Concrete Pump Truck)
29th	●Lighting in the Central Control Room was recovered.
3oth	●White smoke was confirmed to generate continuously. ●Spray of fresh water (Around 140t) over the Spent Fuel Pool using Concrete Pump Truck (50t/h) was carried out. ●Fresh water is being injected to the spent fuel pool

3-17. Chronology of Unit 5 & 6 after the earthquake

● *Unit 5&6*

20th	●Unit 5 under cold shutdown (Water temperature of reactor water is less than 100℃) ●Unit 6 under cold shutdown (Water temperature of reactor water is less than 100℃)
21st	●Water spray over the Common Spent Fuel Pool started
22nd	●Recovering power supply of unit 5 and 6 is completed.
24th	●The power was started to be supplied. Cooling also started
30th	●Bach up power of Unit 6 is in working condition and external power was supplied to Unit 5 as of March 30th

4. Report concerning incidents at spent fuel pools in the Fukushima Dai-ichi NPS

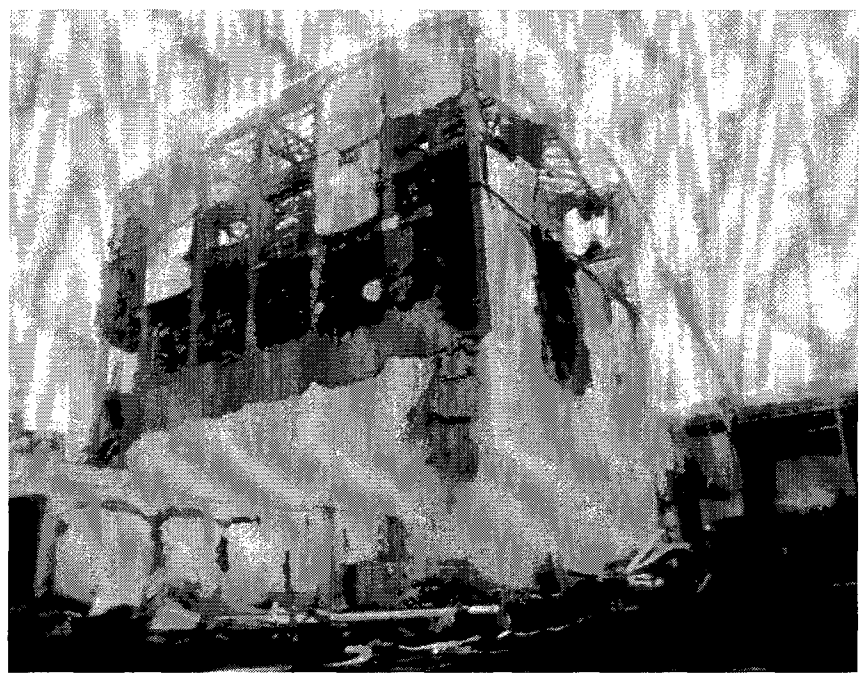
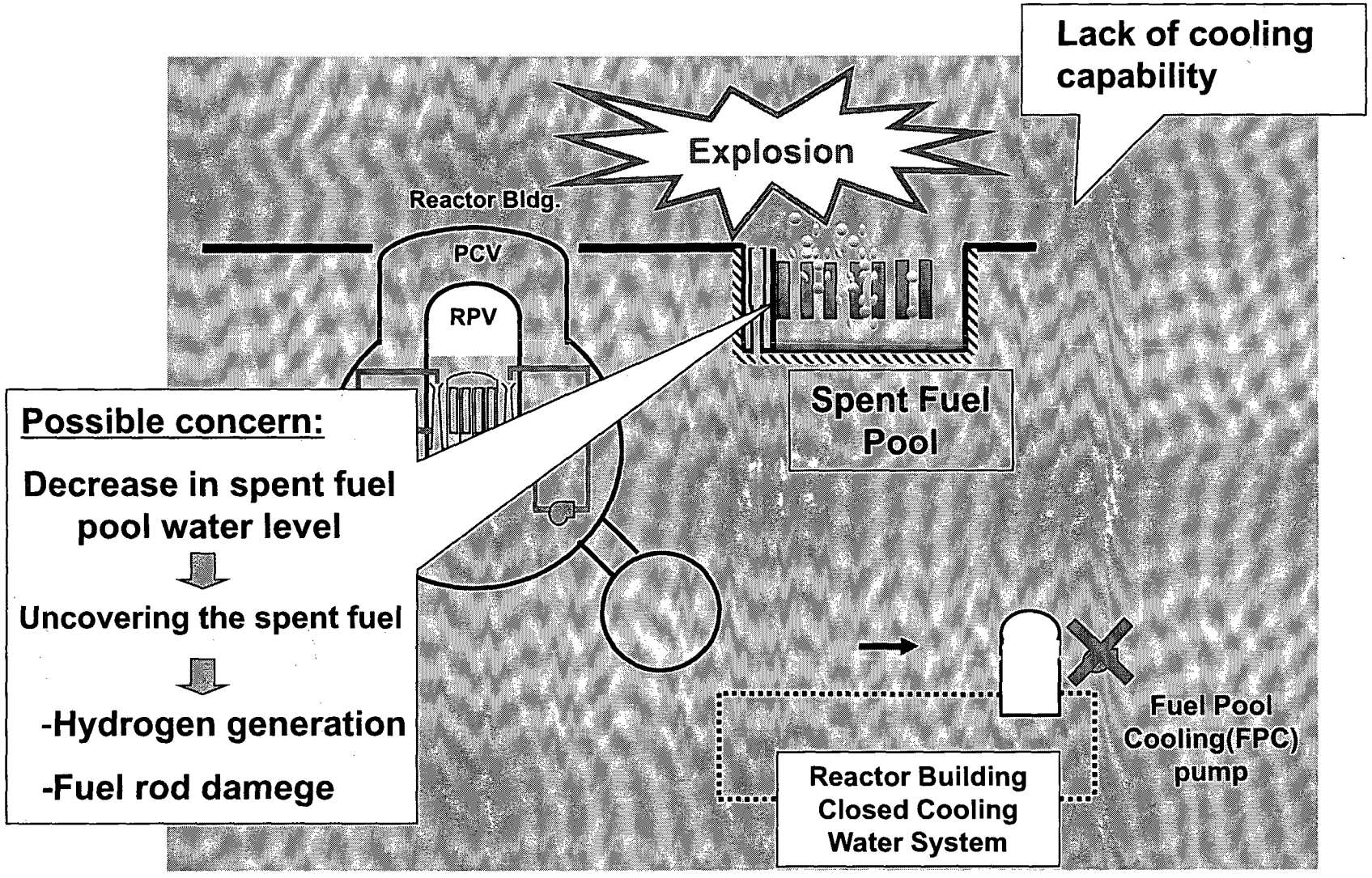


Photo: Water spray into the SFP in Unit 4 using concrete pump truck

4-1. Possible concerns about Spent Fuel Pool



4-2. Status of the Fuel as of March 11, 2011

Unit	1	2	3	4	5	6
Number of Fuel Assembly in the Core	400	548	548	-	548	764
Number of Spent Fuel Assembly in the Spent Fuel Pool	292	587	514	1,331	946	876
Number of New Fuel Assembly in the Spent Fuel Pool	100	28	52	204	48	64
Water Volume (m^3)	1,020	1,425	1,425	1,425	1,425	1,497

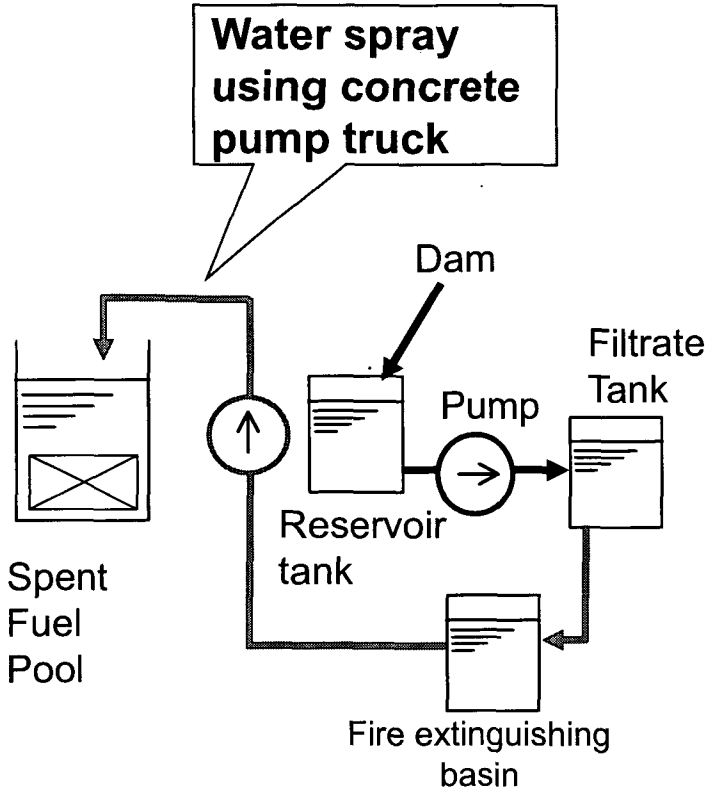
Condition of the fuel in the Spent Fuel Pool

Unit 1	Unit 2	Unit 3	Unit 4
-Most recent shut down was on Sep.27,2010	- Most recent shut down was on Nov.18,2010	- Most recent shut down was on Sep.23,2010	-Most recent shut down was on Nov.29,2010 -All fuel assembly was removed from the core and located in the pool due to the core shroud replacement

4-3. Measures taken to cool the Spent Fuel Pool (1/4)

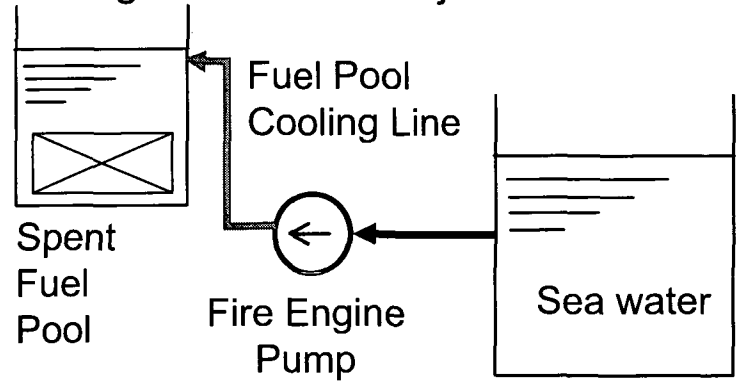
Unit 1

Fresh water injection

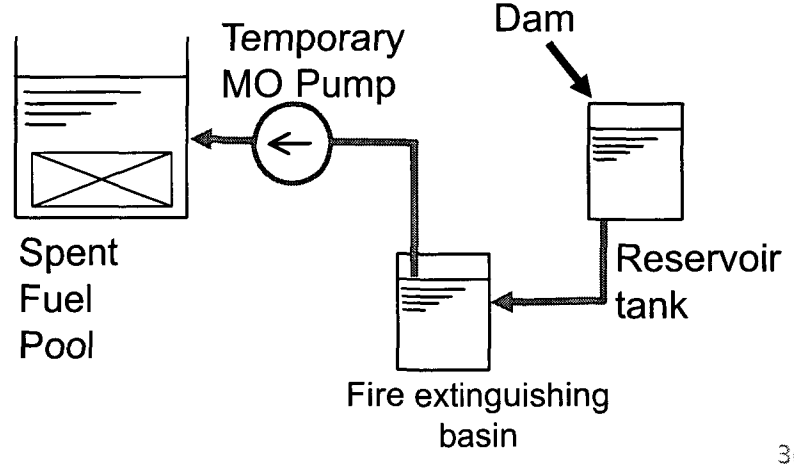


Unit 2

【1st Stage】 Sea water injection



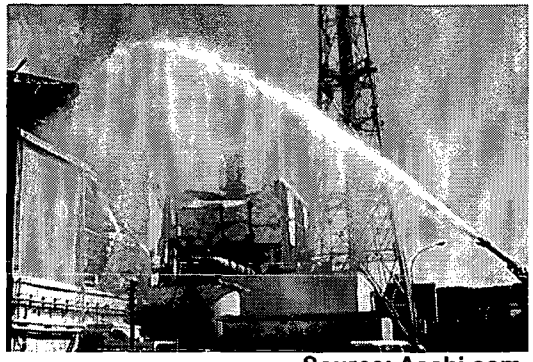
【2nd Stage】 Fresh water injection



4-3. Measures taken to cool the Spent Fuel Pool (2/4)

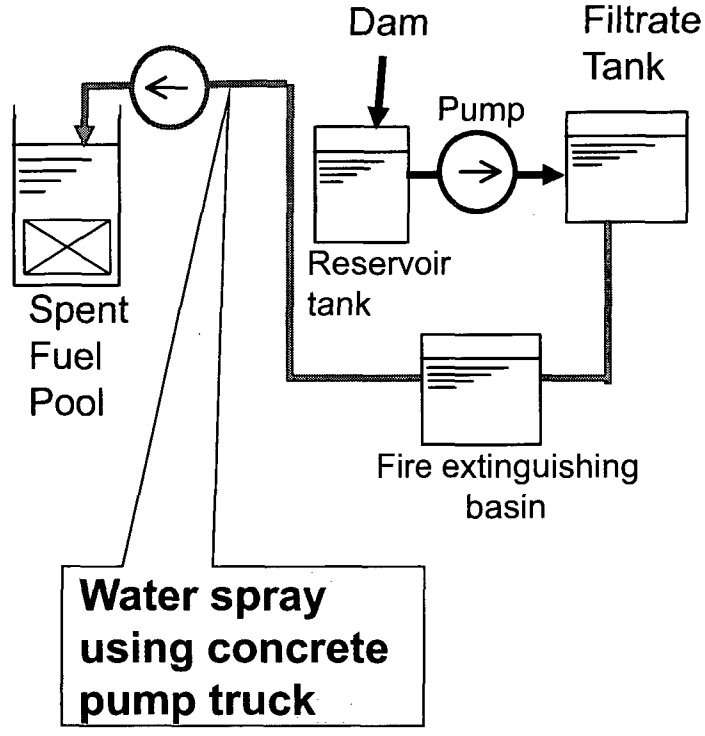
Unit 3

【1st Stage】 Sea water injection



Source: Asahi.com

【2nd Stage】 Fresh water injection

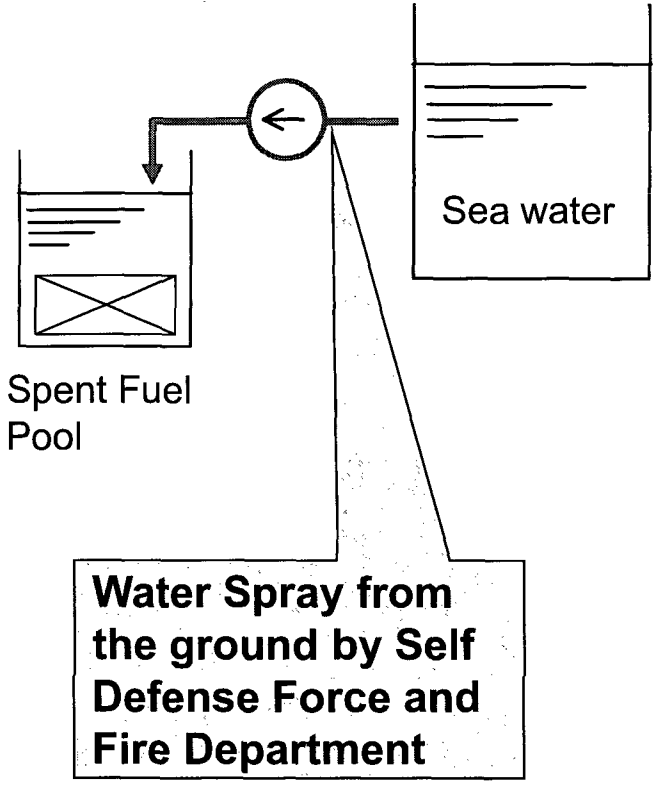


*** Sea water discharge by helicopters of the Self Defense Force**

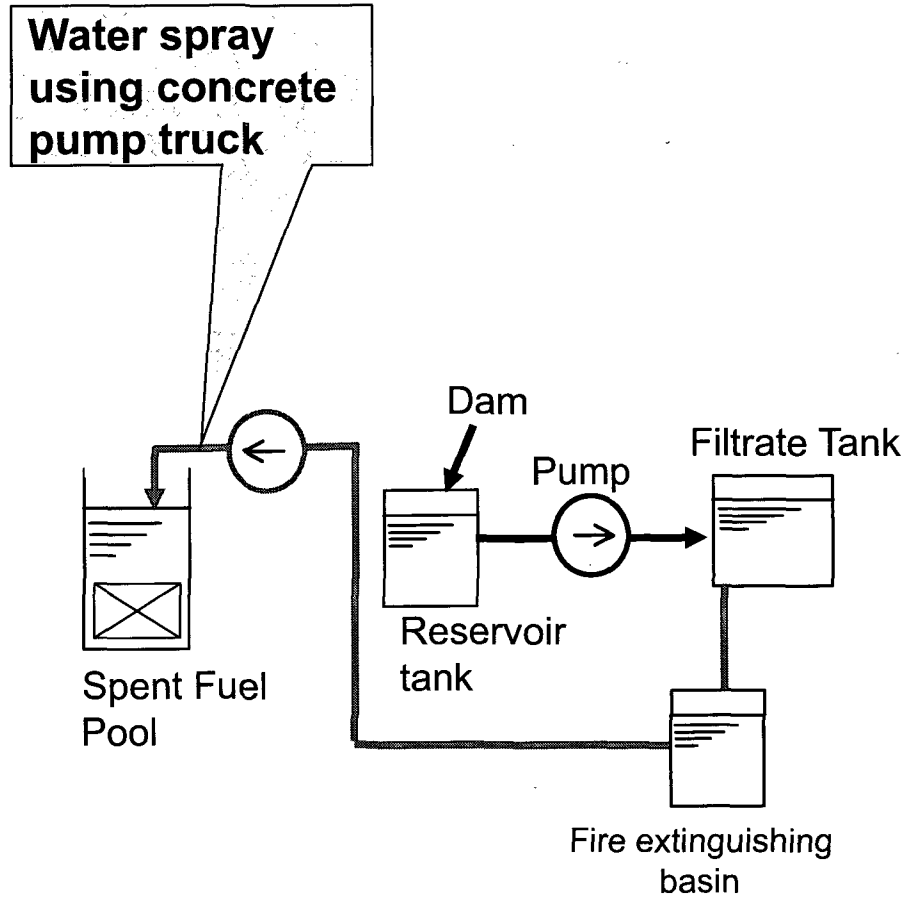
4-3. Measures taken to cool the Spent Fuel Pool (3/4)

Unit 4

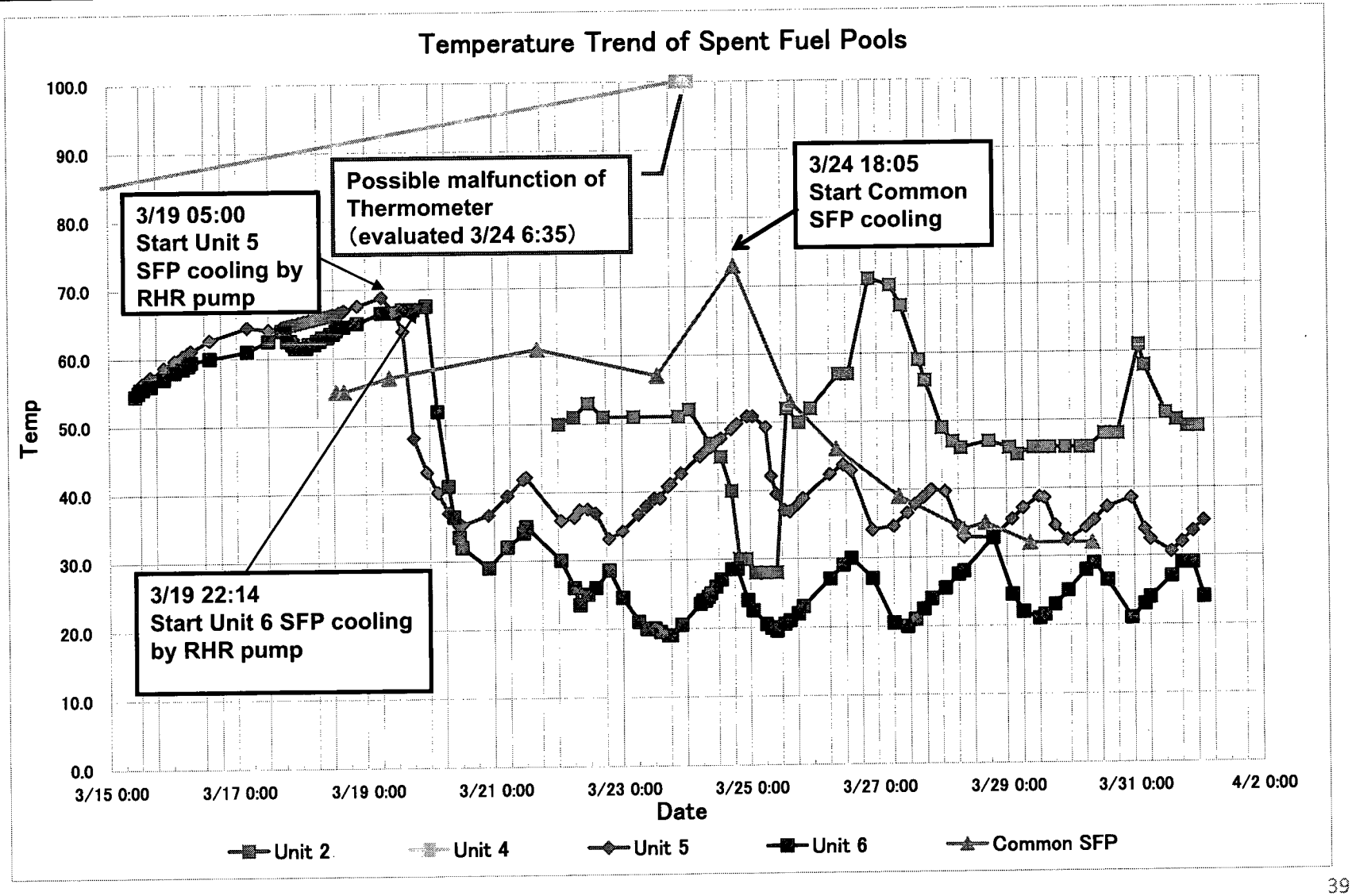
【1st Stage】 Sea water injection



【2nd Stage】 Fresh water injection



4-3. Measures taken to cool the Spent Fuel Pool (4/4)



4-4. INES Rating

- NISA issued temporary INES ratings 3 times. Those provisional ratings are provided based on "What is known" at the time.

- The first temporary rating was issued at 0:30 on March 12 (About 10 hours later from the earthquake attack)
  At that moment, Following units were rated as Level 3 since all heat removal function became inoperable based on "Defense in Depth" criteria.
  - Fukushima dai-ichi unit 1, 2 and 3
  - Fukushima dai-ni Unit 1, 2 and 4

- In the evening on March 12, the rating of Fukushima dai-ichi Unit 1 was re-evaluated to Level 4 base on the "Radiological Barriers and Control" criteria, since the radiation level in the site increased.

- On March 18, re-evaluation was carried out. The rating of Fukushima dai-ichi Unit 1, 2 and 3 were re-rated to Level 5 based on "Radiological Barriers and Control" criteria because the fuel damage was highly possible. Fukushima dai-ichi Unit 4 was evaluated to Level 3 based on the "Defense in Depth" criteria.

5. Action taken by the government

5. Action Taken by the Government(1/5)

March 11th, 2011

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

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

21:23 ●Directives from Prime Minister to the Governor of Fukushima Prefecture and heads of towns were issued regarding the eventoccurred at Fukushima Daiichi NPS, TEPCO, in accordance with the Acton Special Measures Concerning Nuclear Emergency Preparedness as follows:
- Direction for the residents within 3km radius from Unit 1 to evacuate
- Direction for the residents within 10km radius from Unit 1 to stay in-house

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

5. Action Taken by the Government(2/5)

March 12nd, 2011

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

07:45 ●Directives from Prime Minister to the Governor of Fukushima Prefecture and heads of towns were issued regarding the event occurred at Fukushima Dai-ni NPS, TEPCO, pursuant to 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

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

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

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

5. Action Taken by the Government(3/5)

March 13th, 2011

09:30 ●Directive was issued for the Governor of Fukushima Prefecture and heads of towns in accordance with the Act on Special Measures Concerning Nuclear Emergency Preparedness on the contents of radioactivity decontamination screening.

March 15th, 2011

05:30 ●Prime Minister, Kan expressed to establish The Joint Headquarters to Fukushima Dai-ichi NPS accident

10:30 ●According to the Nuclear Regulation Act, 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

11:00 ●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 reactor situation

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

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

March 20th, 2011

23:30 ●Directive from Local Emergency Response Headquarters to the Prefectural Governor and the heads of cities, towns and villages was issued regarding the change of the reference value for the screening level for decontamination of radioactivity

5. Action Taken by the Government(4/5)

March 21st, 2011

07:45 ●Directive titled as "Administration of the stable Iodine" was issued from Local Emergency Response Headquarters to the Prefectural Governor and the heads of cities, towns and villages.

16:45 ●Directive titled as "Ventilation for using heating equipments within the in-house evacuation zone" was issued from the Head of Local Emergency Response Headquarters to the Prefectural Governor and the heads of cities, towns and villages.

17:50 ●Directive from the Head of Government Nuclear Emergency Response Headquarters to the Prefectural Governors of Fukushima, Ibaraki, Tochigi and Gunma was issued, which directs 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 25th, 2011

●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.

5. Action Taken by the Government(5/5)

March 25th, 2011

- Since there was a mistake in the evaluation regarding the concentration measurement of radioactive materials, 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, 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, 2011

- In order to strengthen the system to assist the nuclear accident sufferers, the "Team to Assist the Lives of the Nuclear Accident Sufferer" headed by the Minister of Economy, Trade and Industry was established

March 30th, 2011

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

6. Current situation on resident evacuation and radiation exposure, etc

6-1. Current Situation on Resident Evacuation(1/2)

- At 5:44 on March 12, residents within 10km radius from Unit1 of Fukushima Dai-ichi NPS shall evacuate by the Prime Minister Directive.

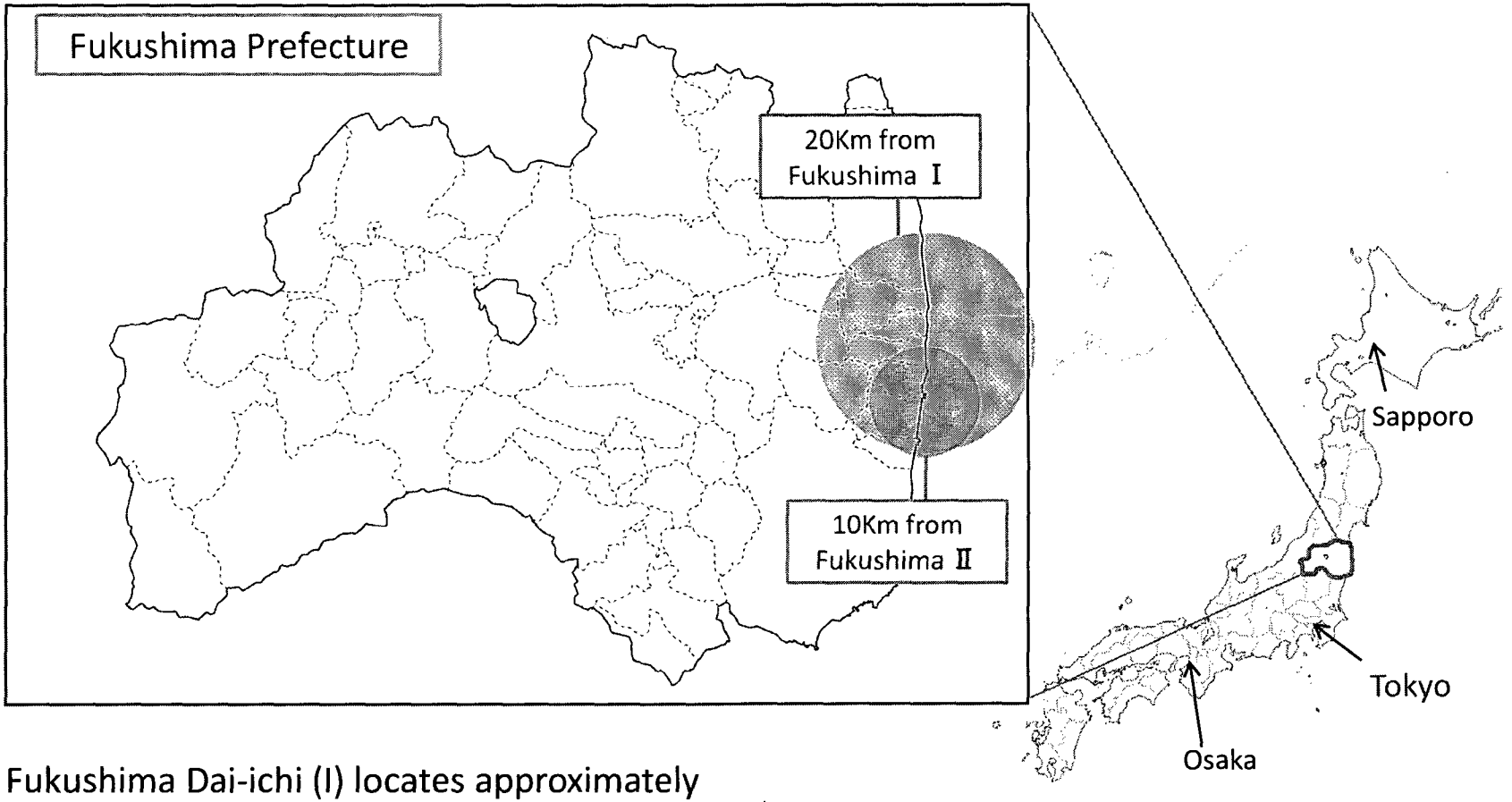
- At18:25 on March 12, Prime Minister directed evacuation of the residents within the 20 km radius from Fukushima Dai-ichi NPS.

- On March 15th, the Local Emergency Response Headquarter issued "the direction to administer the stable Iodine during evacuation from the evacuation area (20 km radius)" to the Prefecture Governors and the heads of cities, towns and villages.

- 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 sheltering stay in the area from 20km to 30km from Fukushima Dai-ichi NPS is made fully known to the residents concerned.
  - Cooperating with Fukushima Prefecture, livelihood support to the residents in the sheltering area are implemented.

- On March 25th, Chief Cabinet Secretary, Edano promoted voluntary evacuations for the residents within the area from 20 km to 30 km from Fukushima Dai-ichi NPS in a press conference.

6-1. Current Situation on Resident Evacuation(2/2)



Fukushima Dai-ichi (I) locates approximately
- 230 km from Tokyo
- 580 km from Osaka
- 600 km from Sapporo

6-2. Major Possibility on radiation exposure to residents (As of 15:30 April 1st)

- 95 patients of Futaba Welfare Hospital transferred by JSDF helicopters and commercial buses. If explosion occurred while 60 patients to be transferred by JSDF helicopters were standing by on Futaba High School playground. No exposure suspected. (19:00, March 16)

- Screening started at Off-site Center on Sat. March 12. 162 screened as of March 15. Against initially-set decontamination threshold of 6,000cpm, 110 patients registered below the threshold, 41 above it. Of 162 screened patients, 5 were given decontamination measures and transferred to hospital.

- Fukushima Prefecture conducted screening at 4 locations in the prefecture. Some 30 people registered above 13,000cpm. After measuring for the second time following decontamination they showed low values, therefore they were returned to shelters without examination.

- 3 women who lived around 10km radius of Fukushima Dai-ichi until March 14 were examined at Iwate Medial University Hospital. Simple decontamination procedure was given without surveying. They were hospitalized for follow-up.

6-3.Major exposure of workers (As of 15:30 April 1st)

- To date a total of 21 people have registered exposure dose above 100mSv. Following measures were taken.

-17 people had facial contamination on March 12 (9 TEPCO employees, 8 support company employees). Exposure identified upon their measurement after returning from Controlled Area. However, the level of exposure would not affect their health.

-At the time of ventilation operation at Unit 1 on March 12, one TEPCO employee registered above 100mSv (106.30mSv/h). As the level was below acute exposure he conducted work after self-air setting. As he afterwards complained of headache and other symptoms, he was transferred to hospital and placed at rest. He now has returned home.

-On March 24, dosage above approx. 170mSv was confirmed on 3 workers who were laying cables on 1st floor and basement of Unit 3 Turbine Bldg. Attachment of radioactive substances on the skin of both legs was confirmed on two of them. Examination showed that none of the 3 had any major systemic risk. Exposure dose on the legs of the 2 was estimated to be 2～3Sv. While the level of leg and internal exposure did not require treatment, they were hospitalized. They were discharged on March 28.

- On April 1st, a worker fell into the sea when he got into a barge of US. He was rescued by workers, and was not injured etc. However, he was confirmed surface contamination and decontaminated by the shower. He was confirmed the non-contamination by nasal smears.

6-4. Major Situation of the injured (As of 15:00 April 3rd)

＜Death due to earthquake(Found on March 30)＞

- Two employees found in the turbine building of Unit 4)

＜Injury due to earthquake(March11)＞

- Two employees (slightly)
- Two subcontract employees (one fracture in both legs)

＜Injury due to the explosion of Unit 1 of Fukushima Dai-ichi NPS(March12)＞

- Four employees were injured at the explosion and smoke of Unit 1 around turbine building (non-controlled area of radiation) and were examined by Kawauchi Clinic.

＜Injury due to the explosion of Unit 3 of Fukushima Dai-ichi NPS(March14)＞

- Four TEPCO's employees
- Three subcontractor employees
- Four members of Self-Defence Force (The member was discharged from the institute on March 17th.)

＜Other injuries＞

- Two subcontractor's employees were injured during working at temporary control panel of power source in the Common Spent Fuel Pool(March22,23)

6-5. Directive regarding foods and drinks

(1) Agricultural Goods

- Ministry of Health, Labor and Welfare (MHLW) set provisional regulatory standards for foods detected with radioactive substances and notified prefectures, etc. as "Handling of food contaminated by radioactivity".
- MHLW notified prefectures, etc. regarding points to be mindful of in examining foods detected with radioactive substances.
- Prime Minister instructed local governments concerned to restrict distribution and/or consumption of foods concerned in accordance with Special Law of Nuclear Emergency Preparedness.
  - Fukushima Pref. (Distribution restricted→spinach, kakina, raw milk, etc.)
  - Ibaraki, Tochigi, Gunma Prefs. (Distribution restricted→spinach, kakina)

(2) Drinking Water

- MHLW notified water suppliers in prefectures concerned the followings regarding response to radioactive substances in tap water caused by the nuclear accident.
  - Refrain from drinking tap water exceeding index values (300Bq/kg for radioactive Iodine, 200Bq/kg for radioactive Cesium) .
  - In case radioactive Iodine exceeds 100Bq/kg, refrain from giving tap water to infants, including preparing infant formula.
  - There is no problem in using tap water for other domestic uses.
  - Lack of substitute drinking water.

7. Implementation Status of Radiation Monitoring

7-1. **Implementation Status of Radiation Monitoring**(1/2)

(1) On-site monitoring (1F) (conducted by TEPCO)

① Measurement of air dose rates

- On site, air dose rates were measured at 1 point using monitoring car and at 3 points using portable dosimeter.

② Analysis of soil samples

- Soils were sampled at 5 on-site points and analyzed.

③ Measurement of water in Turbine Bldg basement and Trench

- Measured concentration of radioactive substances in Turbine Bldg basement and Trench.

④ Sampling of seawater

- Measured concentration of radioactivity around South Flood Gate.

7-1. Implementation Status of Radiation Monitoring(2/2)

(2) Off-site Monitoring (conducted by MEXT and local nuclear emergency response HQ)

① Measurement of air dose rate

Measurement by monitoring car

- MEXT measured air dose rate beyond 20km from 1F using monitoring cars in cooperation with Fukushima Pref., National Police Agency, Defense Ministry, Electric Utility and others concerned.
- local nuclear emergency response HQs measured air dose rate beyond 30km from 1F.

② Measurement of cumulative dose

- MEXT measured cumulative dose rates by installing simplified dosimeters at 10 points.
- local nuclear emergency response HQs measured it by setting equipment 20~50km from 1F.

③ Measurement of radioactive substance concentration in soil, etc.

- MEXT collected dust and soils beyond 20km from 1F and analyzed radioactive substance concentrations in the air and soils.
- local nuclear emergency response HQs measured concentrations in tap water, leaf vegetables, soil and dust in Fukushima Pref.

④ Off-shore monitoring

- MEXT sampled seawater from surface water (1m from the sea surface) and sub-surface (10m above the sea bottom) around 30km off-shore Fukushima Pref. and measured radioactive substance concentrations and also measured air dose rates.

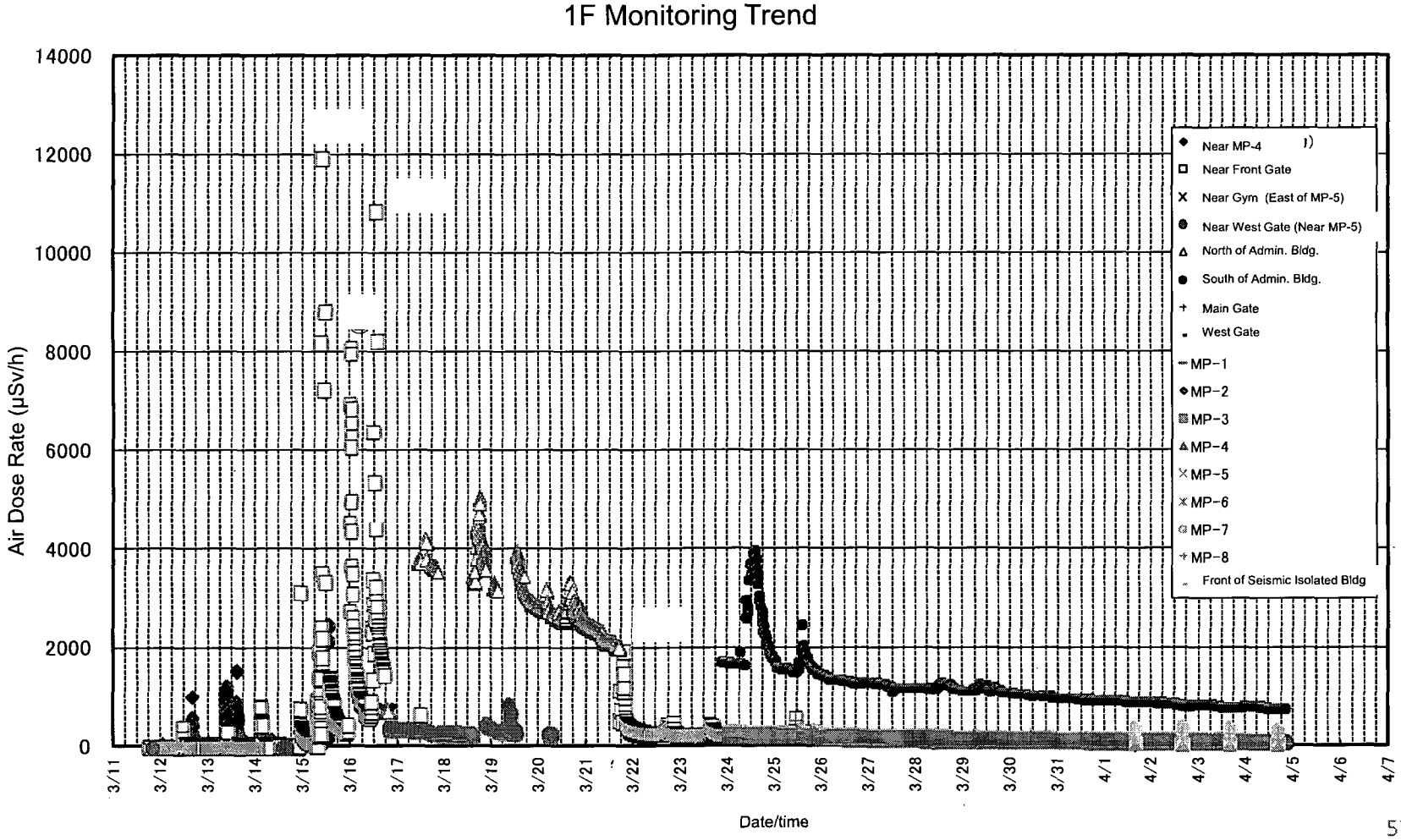
⑤ Aerial monitoring

- MEXT measured radioactive substance concentrations and dose rates in the air using aircrafts.

7-2.Monitoring On-site(1F) (conducted by TEPCO)(1/7)

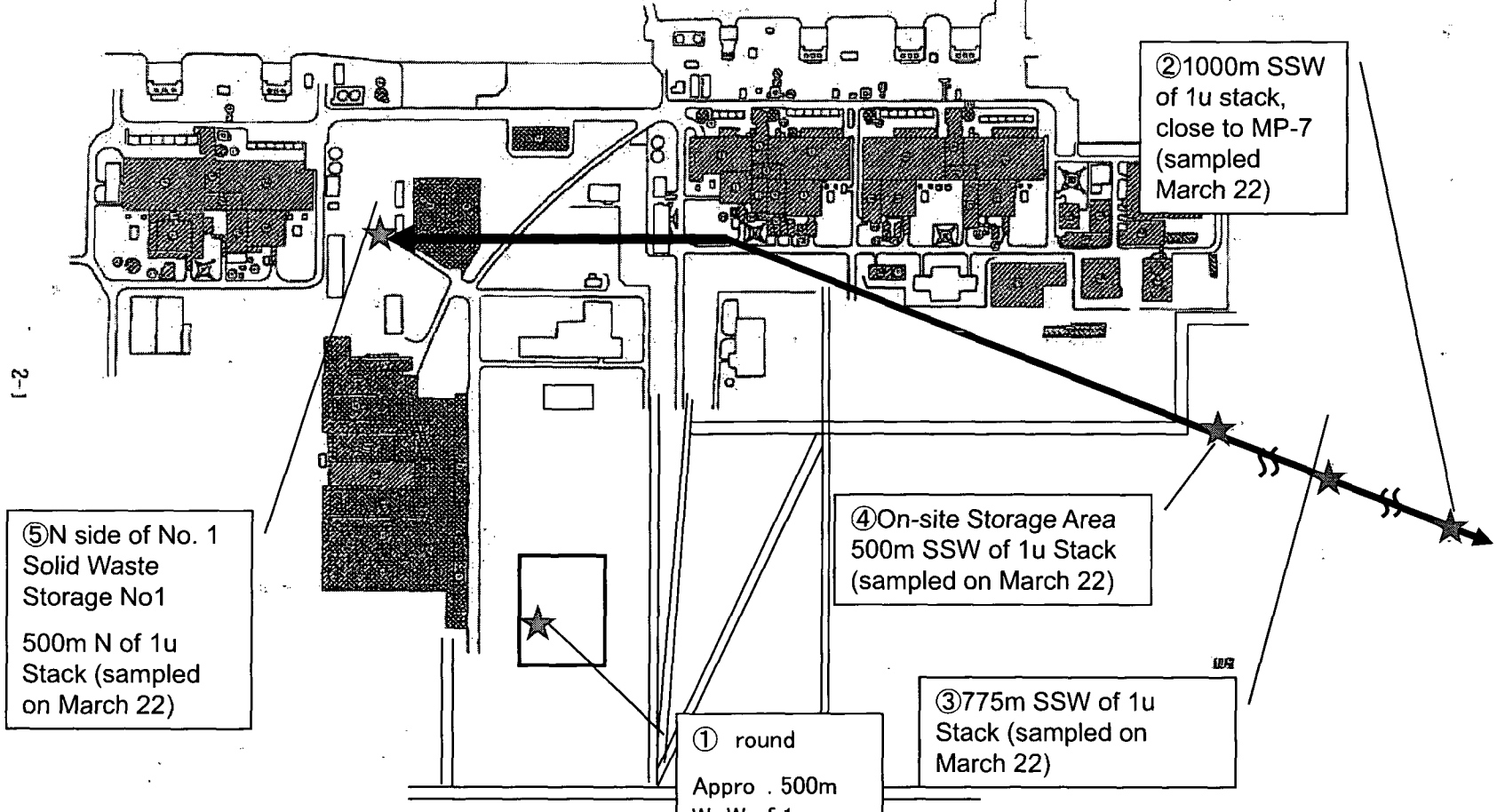
① Measurement of air dose rate

○Registered 11930μSv/h around Front Gate on March 15.



7-2.Monitoring On-site(1F) (conducted by TEPCO)(2/7)

②Detection of radioactive material in the soil on the site of Fukushima Dai-ichi NPS



7-2.Monitoring On-site(1F) (conducted by TEPCO)(3/7)

②Detection of radioactive materials in the soils on the site of Fukushima Dai-ichi

- Density of detected Pu-238, Pu-239 and Pu-240 are within the same level of the fallout observed in Japan after the atmospheric nuclear test in the past.
- Activity ratio of Pu-238 detected at the site field and solid waste storage against Pu-239 and Pu-240 are 2.0 and 0.94 respectively. Those Pus are considered to come from the recent incident.

(Unit: Bq/km・dry soil)

Sampling Spot	Time of sampling	Pu-238	Pu0239, Pu-240
①Site field	13:30, March21	(5.4 0.62) × 10-1	(2.7 0.42) × 10-1
②1km away from Unit ½ exhaust stack	7:00, March 22	N.D	(2.6 0.58) × 10-1
③0.75km away from Unit ½ exhaust stack	7:10, March 22	N.D	1.2 0.12
④0.5 km away from unit ½ exhaust stack	7:18 March 22	N.D	1.2 0.11
⑤Solid waste storage	7:45 March 11	(1.8 0.33) × 10-1	(1.9 0.34) × 10-1
Ordinary domestic soil		N.D～1.5 × 10-1	N.D～4.5

7-2.Monitoring On-site(1F) (conducted by TEPCO)(4/7)

③Water in Turbine Bldg Basement（Results of nuclide analysis in the stagnant water in turbine building basement of each Unit)

- There is pool of water with high radioactive substance concentration in turbine bldg basement of Units 1~4. Above 1,000mSv/h dose has been measured at water surface in Unit 2.
- Water with approx. 100,000 times normal radioactivity concentration in reactor water was confirmed in turbine bldg basement of Unit 2.

Nuclide (half- life time)	Concentration of Radioactivity (Bq/cm^3)			
	Unit 1 (2nd time) Sampled on March 26	Unit 2 Sampled on March 26	Unit 3 (2nd time) Sampled on March 26	Unit 4 Sampled on March 24
	Water level 195mm	Water level 1,000mm	Water level 1,500mm	Water level 940mm
	Dose rate on the surface of the water 60 mSv/h	Dose rate on the surface of the water >1,000 mSv/h	Dose rate on the surface of the water 750 mSv/h	Dose rate on the surface of the water 0.50 mSv/h
Co-56 (about 77 days)	N.D	N.D	N.D	N.D
Co-58 (about 71 days)	N.D	N.D	N.D	2.7×10^{-1}
Co-60 (about 5 years)	N.D	N.D	2.7×10^{2}	N.D
Mo-99 (about 66 hours)	N.D	N.D	N.D	1.0×10^{0}
Tc-99m (about 6 hours)	N.D	8.7×10^{4}	2.2×10^{3}	6.5×10^{-1}
Ru-106 (about 370 days)	N.D	N.D	N.D	3.3×10^{0}
Ag-108m (about 418 years)	N.D	N.D	N.D	N.D
Te-129 (about 70 minutes)	N.D	N.D	N.D	2.6×10^{1}
Te-129m (about 34 days)	N.D	N.D	N.D	1.3×10^{1}
Te-132 (about 3 days)	N.D	N.D	N.D	1.4×10^{1}
I-131 (about 8 days)	1.5×10^{5}	1.3×10^{7}	3.2×10^{5}	3.6×10^{2}
I-132 (about 2 hours)	N.D	N.D	N.D	1.3×10^{1}
I-134 (about 53 minutes)	N.D	N.D	N.D	N.D
Cs-134 (about 2 years)	1.2×10^{5}	2.3×10^{6}	5.5×10^{4}	3.1×10^{1}
Cs-136 (about 13 days)	1.1×10^{4}	2.5×10^{5}	6.5×10^{3}	3.7×10^{0}
Cs-137 (about 30 years)	1.3×10^{5}	2.3×10^{6}	5.6×10^{4}	3.2×10^{1}
Ba-140 (about 13 days)	N.D	4.9×10^{5}	1.9×10^{4}	N.D
La-140 (about 2 days)	N.D	1.9×10^{5}	3.1×10^{3}	7.4×10^{-1}

7-2.Monitoring On-site(1F) (conducted by TEPCO)(5/7)

③Stagnant Water in Trench

- High level of radiation dose was measured at the surface of water in the vertical pit of the tunnel called "trench" which extends from turbine bldg towards the sea.
- In particular, at Unit 2 ambient dosage around the vertical pit is 100~300mSv/h and dosage in surface water 1,000mSv/h, which are far greater than in Units 1 and 3.

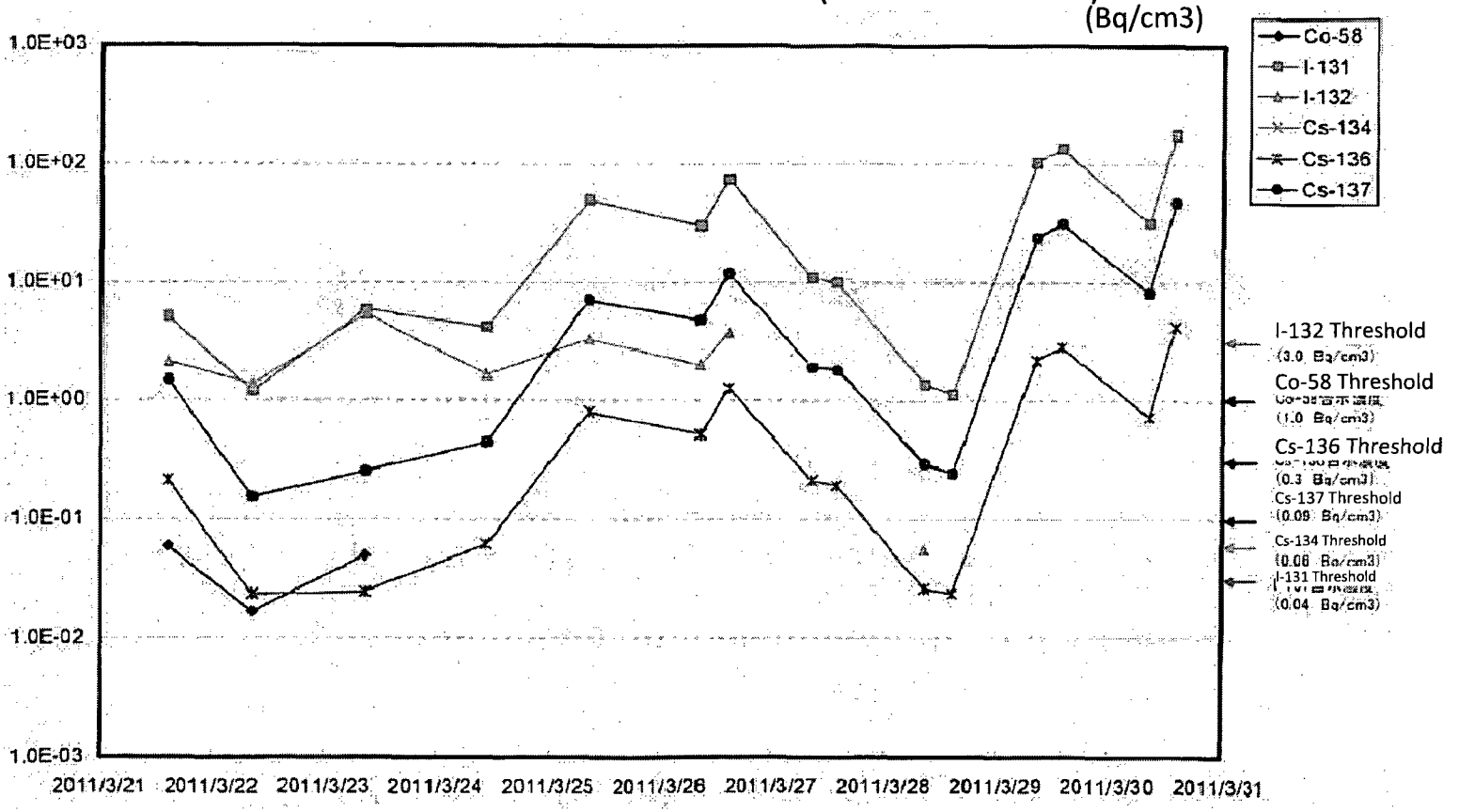
	Unit 1	Unit 2	Unit 3
Location of trench	○Approx. 56m to sea ○162m from turbine bldg (length of trench)	○Approx. 55m to sea ○76m from turbine bldg (length of trench)	○Approx. 69m to sea ○74m from turbine bldg (length of trench)
Trench volume (incl. vertical pit)	3,100m3	6,000m3	4,200m3
Depth of vertical pit	16.9m	16.3m	21.7m
Depth of water in vertial pit	16.8m	15.3m	20.2m
Dosage at water surface	0.4～1.9mSv/h	Above 1000mSv/h	Impossible to measure due to debris
Ambient dosage in vertical pit	0.4～1.0mSv/h	100～300mSv/h	0.8mSv/h

7-2.Monitoring On-site(1F) (conducted by TEPCO)(6/7)

④ Radioactivity Concentration of Seawater Samples Near 1F South Outlet

- Concentration of radioactive iodine131 recorded on March 31th was approx. 4385 times the limit set for water outside the environmental monitoring area.

Concentration in Seawater near (1F South Outlet)

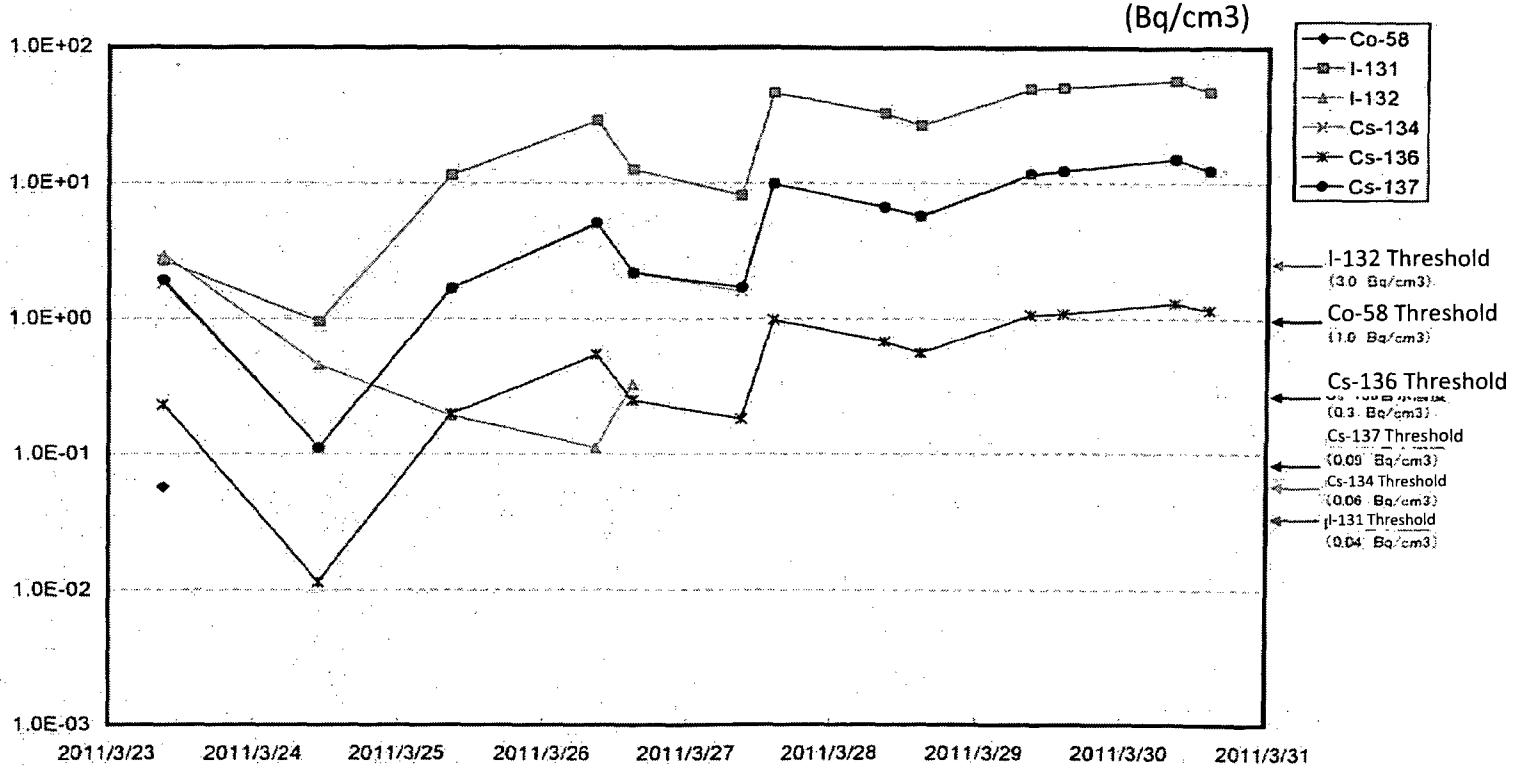


7-2.Monitoring On-site(1F) (conducted by TEPCO)(7/7)

⑤ Radioactivity Concentration of Seawater Samples Near Unit 5 and 6 of 1F in North Outlet

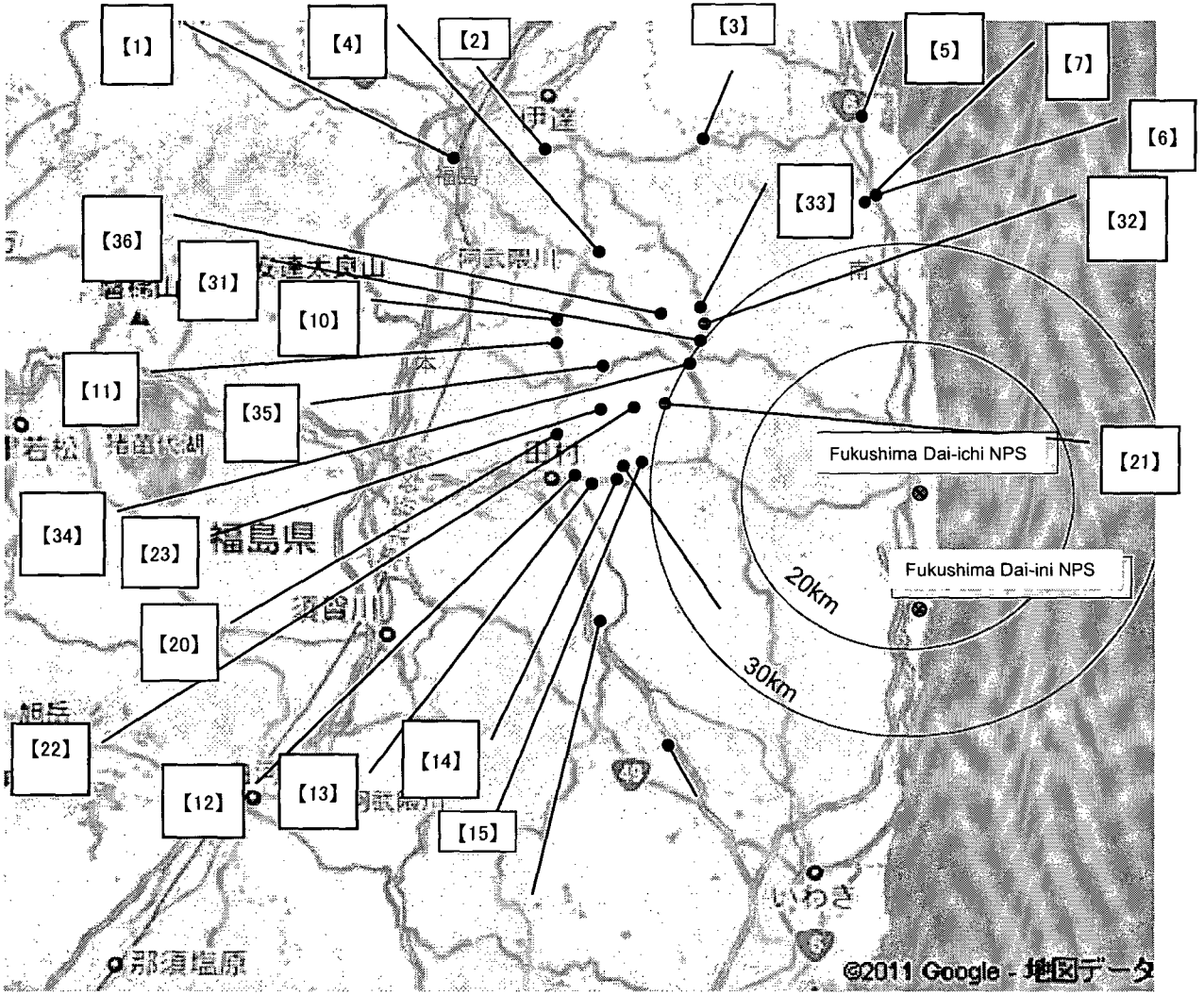
- Concentration of radioactive iodine131 recorded on March 31th was approx. 1425 times the limit set for water outside the environmental monitoring area.

1F 5-6 Northern Water Discharge Canal (Around 30 m north of The 5-6u canal) Radioactive concentration



7-3. Monitoring by MEXT and local nuclear emergency response HQ(1/6)

① Air Dose Rate Measuring Locations Using Monitoring Vehicles

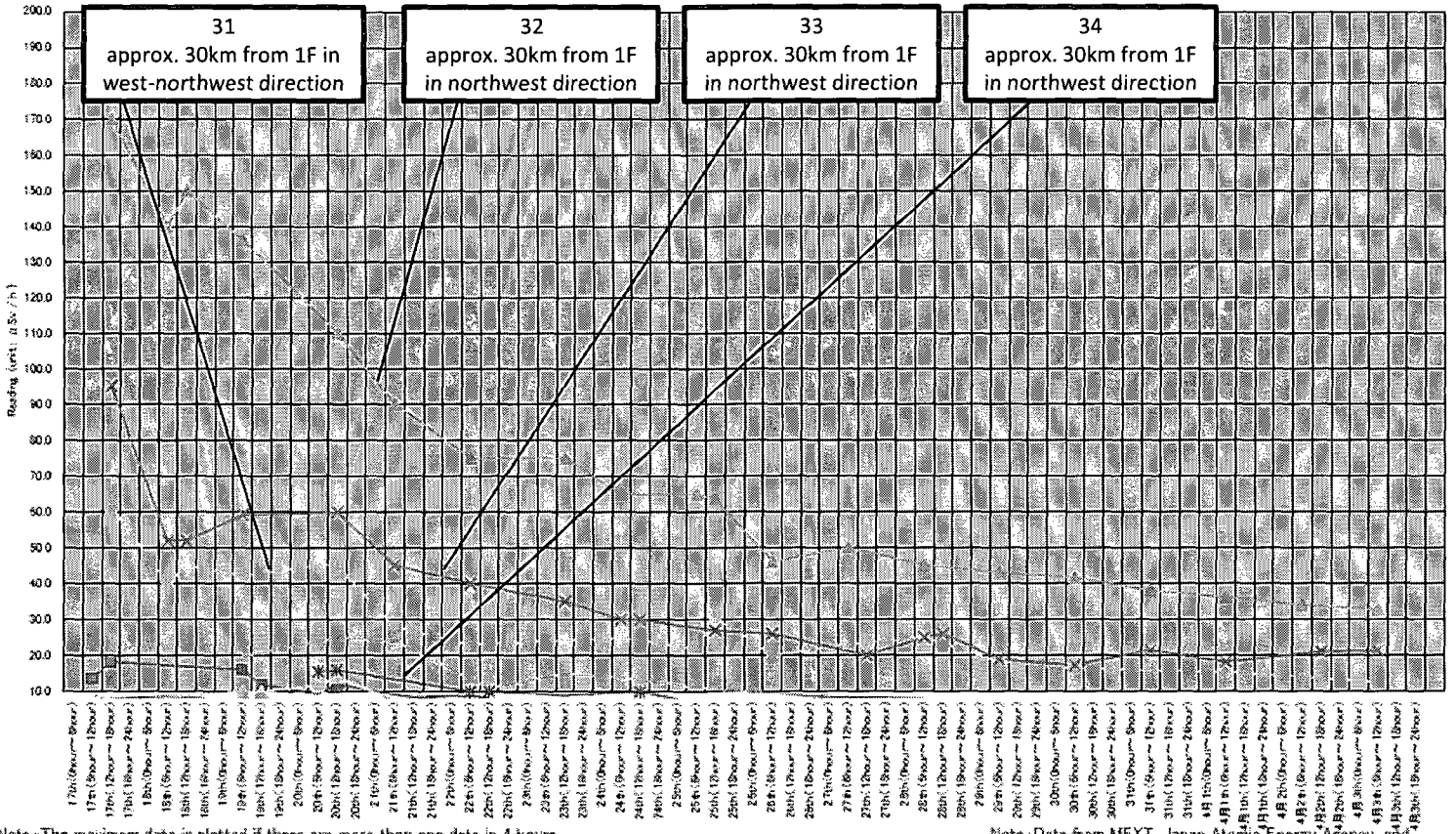


7-3. Monitoring by MEXT and local nuclear emergency response HQ(2/6)

①Air Dose Rate Measured Using Monitoring Vehicles

- Overall dose rate trending down since March 17th.
- E.g. The highest value recorded at Monitoring Point #32 has peaked out at approx. 170μSv/h and has been declining since, rendering no immediate health hazard.

Readings at Monitoring Post out of 20 Km Zone of Fukushima Dai-ichi NPP



Note : The maximam data is plotted if there are more than one data in 4 hours.
Note : This graph only shows the dates over 10μSv/h.

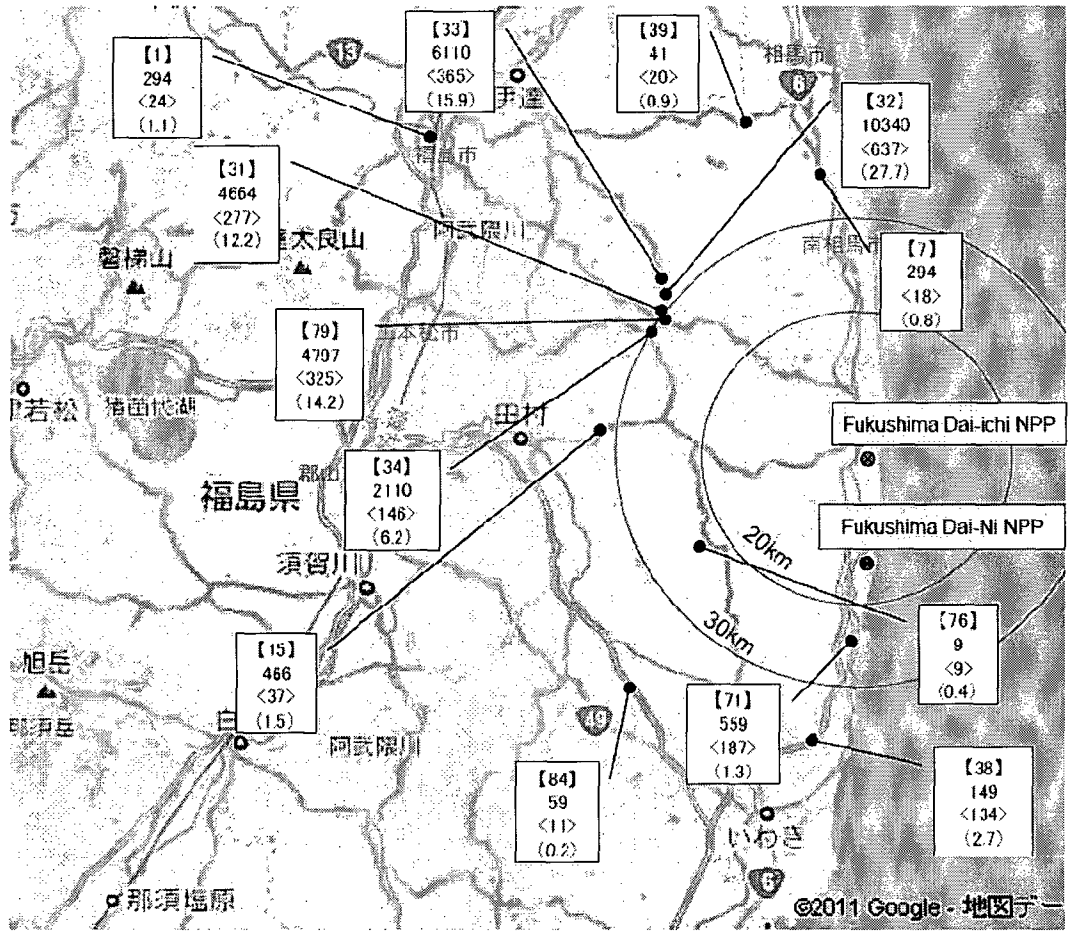
Note : Data from MEXT, Japan Atomic Energy Agency, and NUCLEAR Safety Technology Center

7-3. Monitoring by MEXT and local nuclear emergency response HQ(3/6)

②Cumulative Doses Measured

- Air dose rate cumulatively measured since April 3 topped 10,340μSv at #32, approximately 30km North West from 1F.

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



Monitoring Time
- March 23th～April 3rd (Monitoring Post: 7、31～34、79)
- March 23 th ～28th、April 3rd (Monitoring Post: 71)
- March 24 th ～April 3rd (Monitoring Post: 1、15)
- March 25 th ～April 1st、April 3 rd (Monitoring Post: 84)
- March 31 th ～April 1 st 、April 3rd (Monitoring Post: 38)
- April 1 th ～April 3rd (Monitoring Post: 39)
- April 2 th ～April 3rd (Monitoring Post: 76)

● Monitoring Post

(explanatory note)

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

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

Unit: μ Sv per hour

7-3. Monitoring by MEXT and local nuclear emergency response HQ(4/6)

③Concentration of Radioactive Materials

●Soil Samples

Sampling Point	Address of Sampling Point	Sample	Sort or Region	Sampling Time and Date	Radioactivity Concentration (Bq/kg)	
					^{131}I	^{137}Cs
[2-1] (About40kmNorthWest)	Iitate Village	Land Soil	Soil	2011/3/19 11:40	300,000	28,100
	Iitate Village	Land Soil	Soil	2011/3/20 12:40	1,170,000	163,000
	Iitate Village	Land Soil	Soil	2011/3/21 12:32	207,000	39,900
	Iitate Village	Land Soil	Soil	2011/3/22 12:00	256,000	57,400
	Iitate Village	Land Soil	Soil	2011/3/23 12:25	135,000	32,200
	Iitate Village	Land Soil	Soil	2011/3/24 13:05	45,500	1,870
	Iitate Village	Land Soil	Soil	2011/3/25 13:05	265,000	27,900
	Iitate Village	Land Soil	Soil	2011/3/26 12:00	564,000	227,000
	Iitate Village	Land Soil	Soil	2011/3/26 15:20	82,000	26,000
	Iitate Village	Land Soil	Soil	2011/3/27 11:40	169,000	29,100
	Iitate Village	Land Soil	Soil	2011/3/27 12:00	69,900	20,800
	Iitate Village	Land Soil	Soil	2011/3/28 11:50	14,000	2,040
	Iitate Village	Land Soil	Soil	2011/3/28 12:10	23,100	860
	Iitate Village	Land Soil	Soil	2011/3/29 11:50	53,700	5,650
	Iitate Village	Land Soil	Soil	2011/3/29 12:10	58,400	25,100
	Iitate Village	Land Soil	Soil	2011/3/30 12:25	69,000	32,300
	Iitate Village	Land Soil	Soil	2011/3/30 12:45	11,900	408
	Iitate Village	Land Soil	Soil	2011/3/31 11:30	149,000	27,600
	Iitate Village	Land Soil	Soil	2011/3/31 11:45	60,800	26,500
	Iitate Village	Land Soil	Soil	2011/4/1 11:30	146,000	43,700
	Iitate Village	Land Soil	Soil	2011/4/1 12:05	21,400	1,410
	Iitate Village	Land Soil	Soil	2011/4/2 11:24	55,500	8,140
	Iitate Village	Land Soil	Soil	2011/4/2 11:48	61,900	30,900

7-3. Monitoring by MEXT and local nuclear emergency response HQ(4/6)

③Concentration of Radioactive Materials

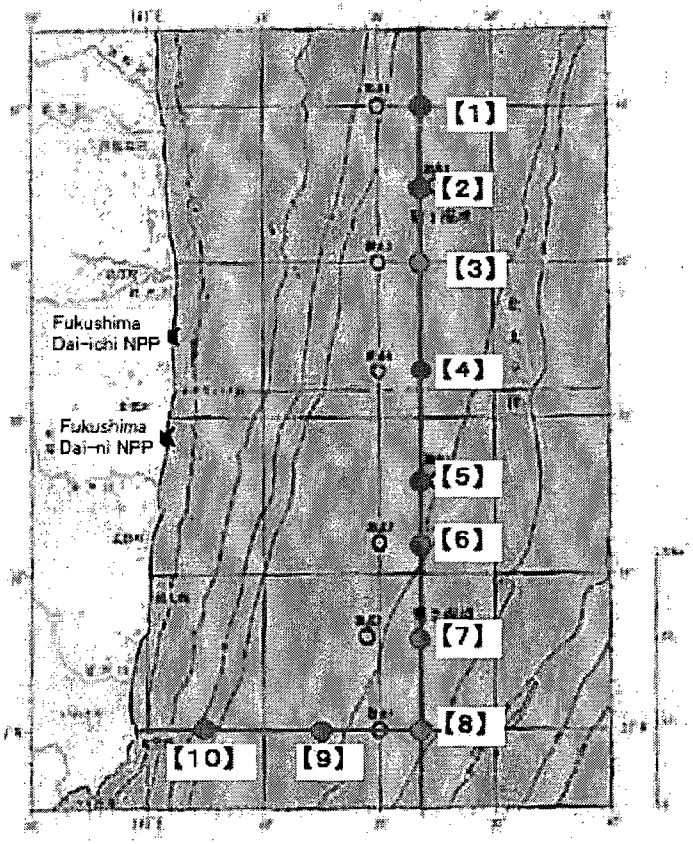
- Dust Samples

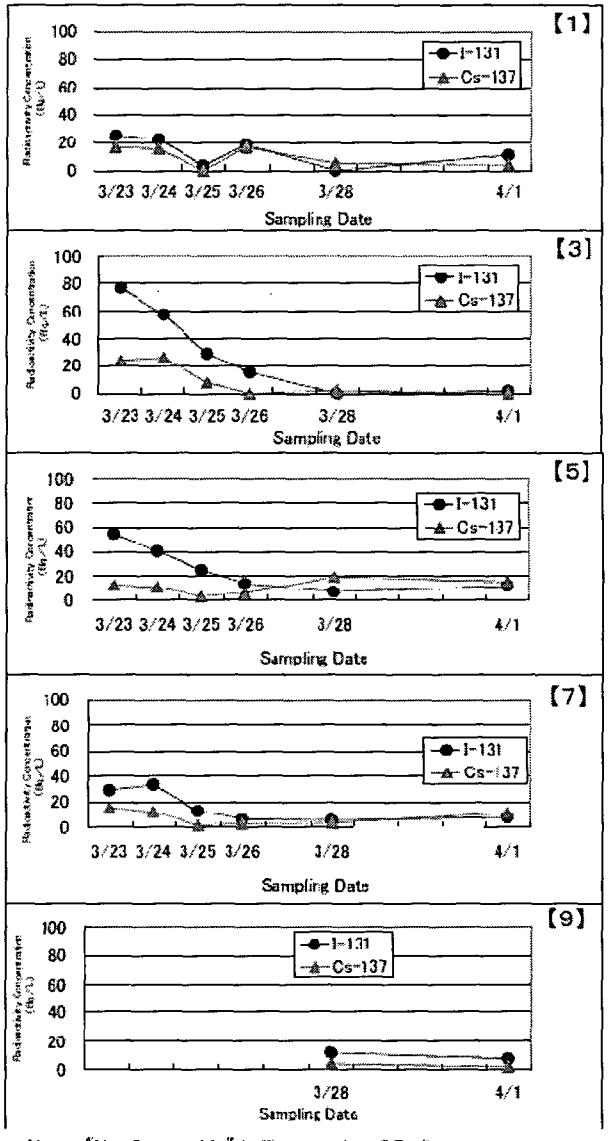
Sampling Point	Sampling Time and Date	Radioactivity Concentration(Bq/m3)		Reading (μSv/h)
		^{131}I	^{137}Cs	
【2-1】(About40 kmNorthWest)	3/21 13:00～13:20	12.80	2.37	4.1
	3/22 12:26～12:46	5.87	ND	4.2
	3/23 12:50～13:10	2.99	ND	16.8
	3/24 13:30～13:50	5.80	1.51	10.0
	3/25 12:45～13:05	5.87	ND	12.3
	3/26 12:26～12:46	5.39	1.33	7.8
	3/27 12:06～12:26	2.22	ND	11.2
	3/28 12:05～12:25	1.66	ND	9.6
	3/29 12:07～12:27	2.42	6.79	9.2
	3/30 13:22～13:42	3.47	LTD	8.5
	3/31 11:50～12:10	1.74	LTD	8.0
	4/1 12:00～12:20	1.78	1.69	7.7
	4/2 11:46～12:06	0.84	ND	8.6

7-3. Monitoring by MEXT and local nuclear emergency response HQ(5/6)

④Sea Water Monitoring Around Fukushima Dai-ichi NPS

●Concentration of radioactive materials at location #3 peaked at 76.8Bq/L, exceeding the limit for the environmental monitoring area.





Note: "Not Detectable" is illustrated as OBq/L.

7-3. Monitoring by MEXT and local nuclear emergency response HQ(6/6)

⑤Aerial Monitoring

- Flight Details : April 1st, from 11:02 to 13:45, cloudless skies with S winds
  Average altitude 1070 meters above sea, average speed 220km/h

Main Reading Point	City	Latitude longitude	Altitude above sea level [above ground level] (m)	Monitoring Time	Readings(μSv/h)
【1】	Shirakawa (Fukushima Prefecture)	37° 03.39′N 140° 17.38′E	1193 [851]	11:45	0.0409
【2】	Iwaki (Fukushima Prefecture)	36° 32.19′N 140° 53.19′E	1209 [1203]	11:57	0.0261
【3】	Tamura (Fukushima Prefecture)	37° 27.16′N 140° 34.19′E	1267 [844]	12:13	0.0281
【4】	Shinchi-cho (Fukushima Prefecture)	37° 46.46′N 140° 52.50′E	1182 [1117]	12:23	0.0275
【5】	Fukushima (Fukushima Prefecture)	37° 47.12′N 140° 29.47′E	900 [842]	12:37	0.0234
【6】	Kooriyama (Fukushima Prefecture)	37° 26.33′N 140° 22.46′E	933 [691]	12:47	0.0402
【7】	Shirakawa (Fukushima Prefecture)	37° 09.40′N 140° 12.59′E	898 [502]	12:56	0.0402
【8】	Utunomiya (TochigiPrefecture)	36° 35.02′N 140° 00.49′E	888 [737]	13:14	0.0147

8. Provision of Relevant Information Overseas

8. Provision of relevant information overseas(1/2)

1. Communication to IAEA and its Member States

(1) ENAC Website

NISA has constantly been providing facility-related and other relevant information on the Emergency Notification and Assistance Convention Website, designed for member states to exchange information on nuclear accidents.

(2) IEC (IAEA)

NISA has constantly been providing the Incident and Emergency Centre of IAEA with press releases and other relevant information, as well as responses to questions on such communication.

(3) Others

-March 21st Technical Briefing

Following the special meeting of the IAEA Board of Governors, NISA officials briefed the member state representatives on the overview of the earthquake itself as well as the status of and ongoing measures to address the Fukushima NPS accident.

-IAEA Expert Missions

The Government of Japan has been receiving IAEA expert missions to Japan.

8. Provision of relevant information overseas(2/2)

2. To International Media in Japan

(1) Foreign Media Briefing

- NISA joins relevant government agencies in daily foreign media briefings at the PM's official residence on March 14, 17 and every day afterwards.
- NISA officials give account to damages suffered at Fukushima NPSs and respond to questions.
- English documents distributed include updates on earthquake-related damange, status of F1 NPSs and monitoring results in the vicinity.

(2) Briefings for Diplomatic Representatives in Tokyo

- NISA joined the Ministry of Foreign Affairs in briefing sessions for Diplomatic representatives in Tokyo.
- Distributed press releases (English), provided explanations and answered questions.

(3) English information on the Web

- Nuclear and Industrial Safety Agency: http://www.nisa.meti.go.jp/english/index.html
- Office of Prime Minister http://www.kantei.go.jp/foreign/index-e.html

9. Remarks

9. Remarks

- Continue to make every possible efforts to bring the situation under control
- Will identify the cause of the accident completely and review safety assurance measures
- Offer the information as much as possible and share the experience and knowledge of the accident with the international community