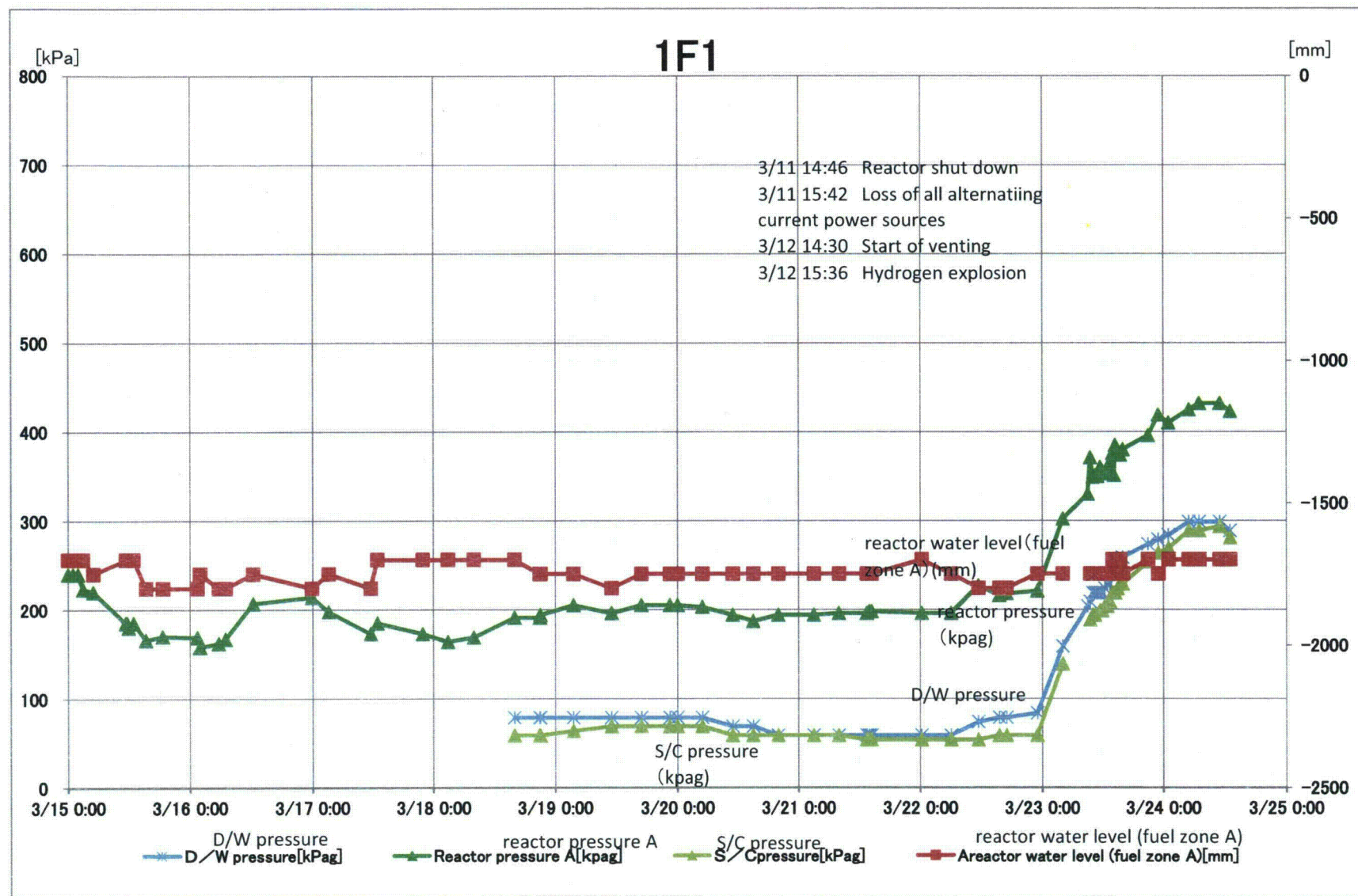
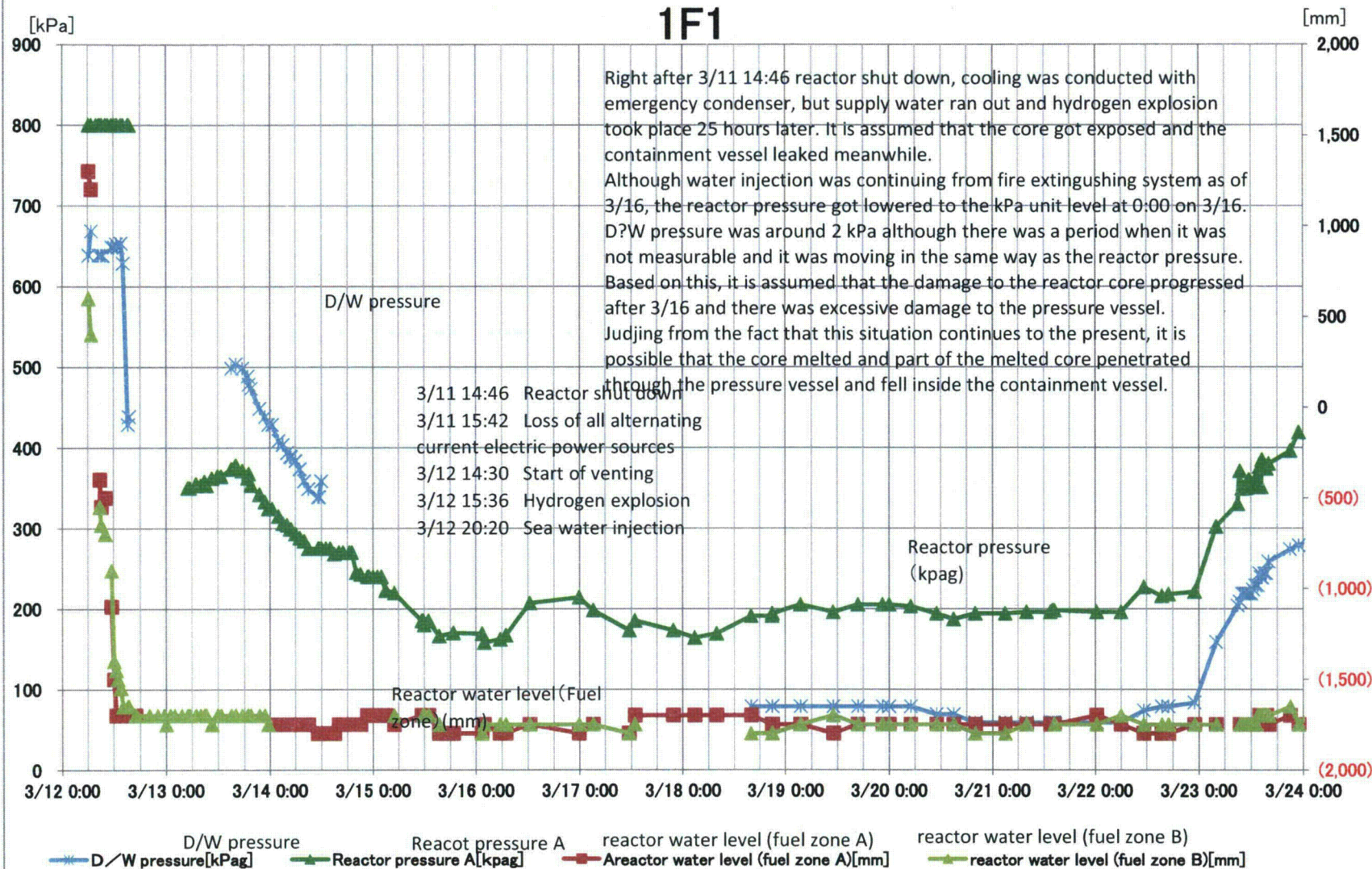
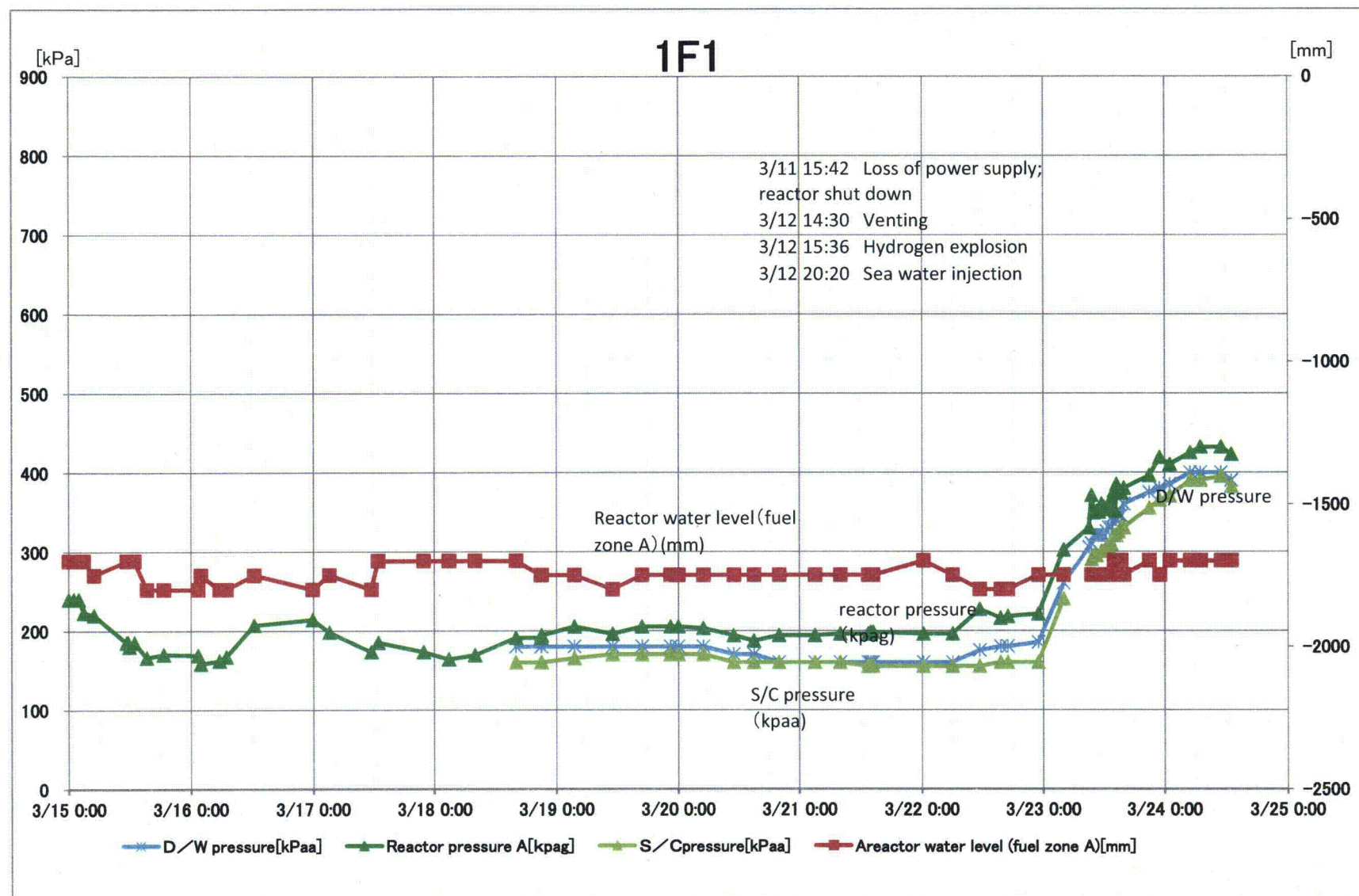

From: LIA10 Hoc
Sent: Thursday, March 24, 2011 10:52 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: Excel sheet translation 1
Attachments: 1 F1Trend_110318-E.xls

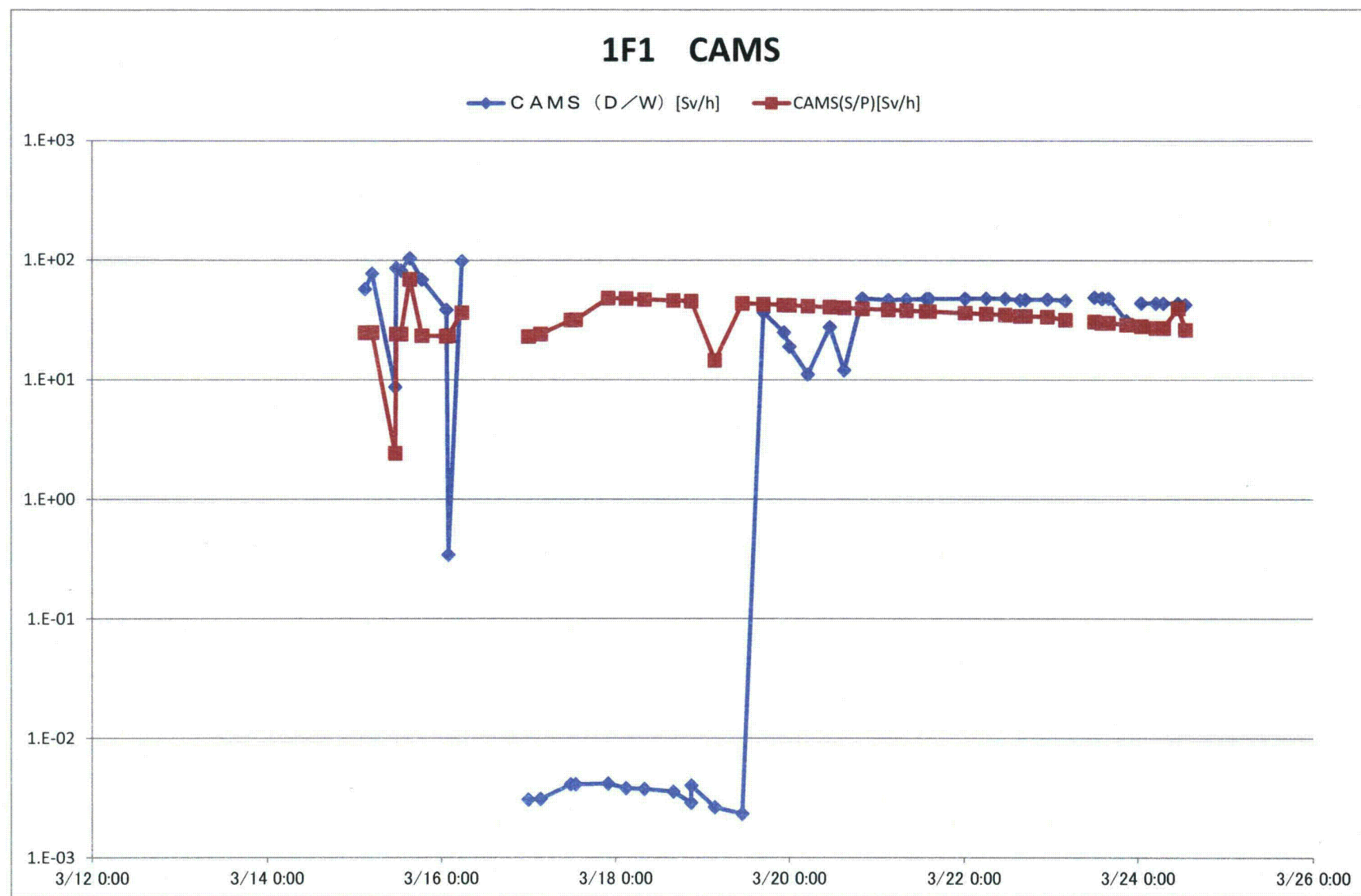
Excel sheet translation 1 attached.

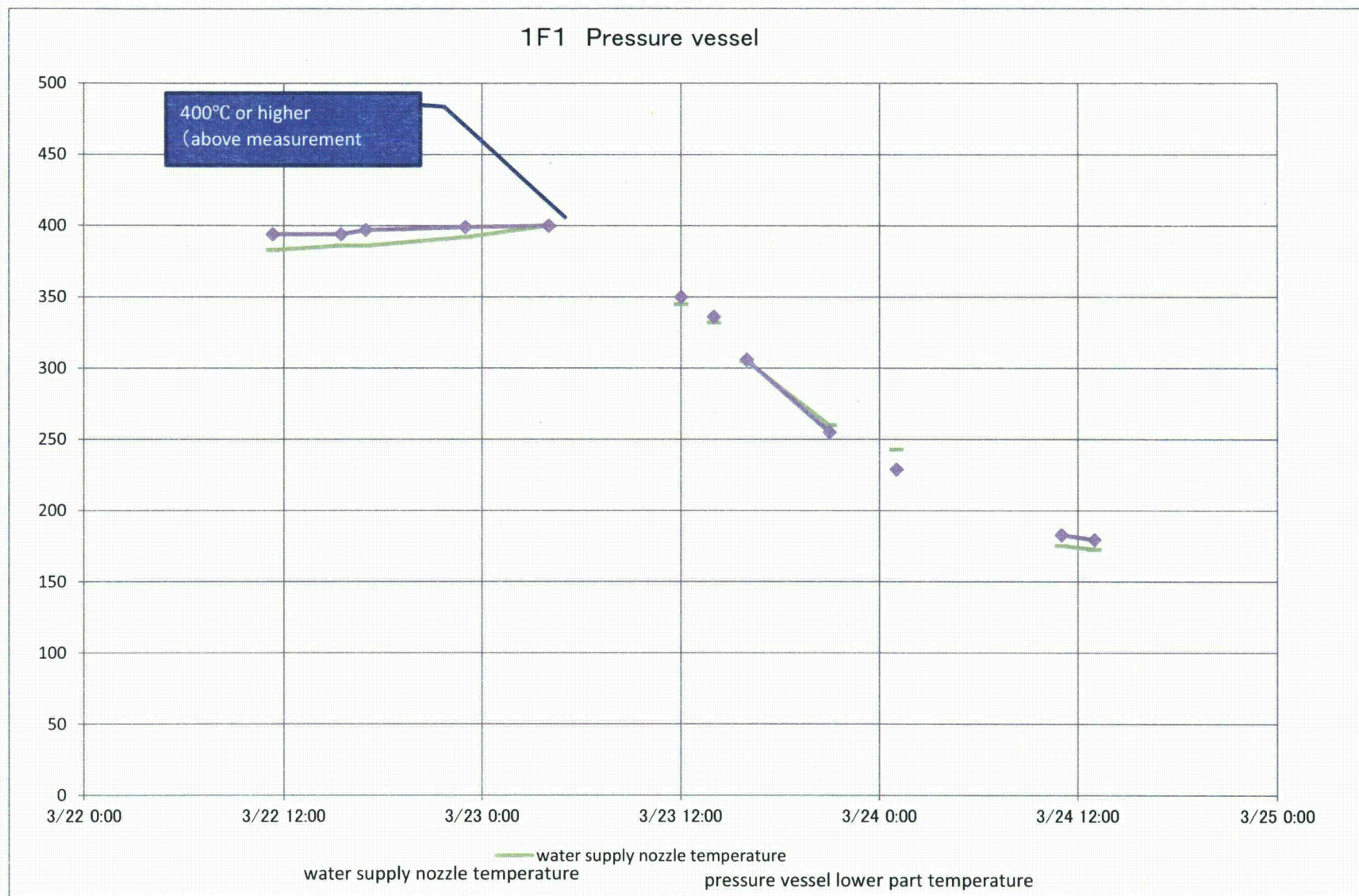


1F1









From: Ramsey, Jack
Sent: Thursday, March 24, 2011 8:35 AM
To: LIA02 Hoc
Cc: LIA03 Hoc; Virgilio, Martin; Muessle, Mary; Mamish, Nader
Subject: RE: Bruce Mallet

My understanding is that Mary Muessle has taken care of this. Please forward any further questions directly to Mary.

From: LIA02 Hoc
Sent: Thursday, March 24, 2011 8:30 AM
To: Ramsey, Jack
Cc: LIA03 Hoc
Subject: Bruce Mallet

Jack,

We are being asked if Bruce Mallet is going to be rehired. We need to get answer to Marty.

Please let me know.

Steve

KKKK-82

From: LIA02 Hoc
Sent: Thursday, March 24, 2011 1:50 PM
To: LIA06 Hoc; LIA08 Hoc; RST01 Hoc
Subject: FW: Nikkei article 2011/3/24 14:00

From: LIA10 Hoc
Sent: Thursday, March 24, 2011 1:44 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: Nikkei article 2011/3/24 14:00

Tepco: "We don' t know cause" of Fukushima Daiichi Units 1-4 White Smoke

2011/3/24 14:00
div/div.JSID_key_html
\$.JSID_actGadgetReload_scrap

On March 24 (PM) Tepco avoided giving any clear explanation regarding the white smoke confirmed at Fukushima NPS Units 1-4 since this morning, saying "we really don't know what to say about the cause but we will monitor it."

東京電力は 24 日午後、今朝から福島第 1 原子力発電所の 1 ～ 4 号機から白煙が確認されたことに関して「原因は何とも言えない。注視していく」と述べ、明確な説明を避けた。

東電、福島原発 1 ～ 4 号機から白煙「原因分らず」

2011/3/24 14:00
div/div.JSID_key_html
\$.JSID_actGadgetReload_scrap

東京電力は 24 日午後、今朝から福島第 1 原子力発電所の 1 ～ 4 号機から白煙が確認されたことに関して「原因は何とも言えない。注視していく」と述べ、明確な説明を避けた。

KKKK-83

From: PMT07 Hoc
Sent: Thursday, March 24, 2011 8:10 PM
To: LIA03 Hoc
Subject: FW: Sharing assumptions with Taiwan as well

FYI

From: PMT07 Hoc
Sent: Thursday, March 24, 2011 6:54 PM
To: Emche, Danielle
Cc: Hoc, PMT12
Subject: FW: Sharing assumptions with Taiwan as well

Danielle,

Please include Taiwan into the daily calls we have with France, the UK and Canada, and provide them the dial-in info.

Thanks in advance.

From: PMT01 Hoc
Sent: Thursday, March 24, 2011 6:12 PM
To: Hoc, PMT12; PMT07 Hoc
Subject: FW: Sharing assumptions with Taiwan as well

From: LIA03 Hoc
Sent: Thursday, March 24, 2011 5:13 PM
To: PMT01 Hoc; PMT02 Hoc
Cc: Emche, Danielle
Subject: FW: Sharing assumptions with Taiwan as well

PMT guys,

Below is the response that I got as a result of a meeting that occurred today between OIP staff and AIT/TECRO (Taiwan). OIP indicates that the technical exchange arrangements are in place to share this information. I don't know if it would be better for you to contact them separately or if you just want to loop them into your calls with France, the UK and Canada. Danielle is interested in sitting in on that call and can put you in touch with the correct folks. Please let me know if you have any questions!

Thanks,
-Jenny

From: Emche, Danielle
Sent: Thursday, March 24, 2011 4:59 PM
To: LIA03 Hoc
Subject: RE: RI Request on TP re: coordination with Japanese Govt on PAR

Oh, yes! Thank you! We had a conversation and they want us to share the assumptions verbally, like we did with France, UK and Canada. The assistant secretary, DOS has also asked NRC to share this. Can you ask

KKKK-84

the PMT lead about a teleconference tomorrow to do a verbal? I could also listen in from home. We do have an arrangement for technical exchange now in place with Taiwan, so from OIP's standpoint, we're covered.
Danielle

From: LIA07 Hoc
Sent: Thursday, March 24, 2011 6:24 AM
Subject: 0600 EDT (March 24, 2011) USNRC Earthquake/Tsunami Status Update
Attachments: NRC Status Update 3.24.11--0600 EDT.pdf

Please find attached a 0600 EDT (March 24, 2011) status update from the US Nuclear Regulatory Commission's Emergency Operations Center regarding the impacts of the earthquake/tsunami.

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

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

-Jim

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

KKKK-85

From: LIA06 Hoc
Sent: Thursday, March 24, 2011 6:42 AM
To: Boger, Bruce; Virgilio, Martin
Subject: FYI: Chairman Tasking Memo
Attachments: Chairman's Tasking Memo 03 23.pdf

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

KKKK-86

March 23, 2011

MEMORANDUM TO: R. W. Borchardt
Executive Director for Operations

FROM: Chairman Jaczko /RA/

SUBJECT: TASKING MEMORANDUM – COMGBJ-11-0002 – NRC
ACTIONS FOLLOWING THE EVENTS IN JAPAN

The staff should establish a senior level agency task force to conduct a methodical and systematic review of our processes and regulations to determine whether the agency should make additional improvements to our regulatory system and make recommendations to the Commission for its policy direction. The review should address the following near term and then longer term objectives.

Near Term Review

- This task force should evaluate currently available technical and operational information from the events that have occurred at the Fukushima Daiichi nuclear complex in Japan to identify potential or preliminary near term/immediate operational or regulatory issues affecting domestic operating reactors of all designs, including their spent fuel pools, in areas such as protection against earthquake, tsunami, flooding, hurricanes; station blackout and a degraded ability to restore power; severe accident mitigation; emergency preparedness; and combustible gas control.
- The task force should develop recommendations, as appropriate, for potential changes to inspection procedures and licensing review guidance, and recommend whether generic communications, orders, or other regulatory requirements are needed.
- The task force efforts should be informed by some stakeholder input but should be independent of industry efforts.
- The report would be released to the public per normal Commission processes (including its transmission to the Commission as a Notation Vote Paper).

To ensure the Commission is both kept informed of these efforts and called upon to resolve any policy recommendations that surface, the task force should, at a minimum, be prepared to brief the Commission on a 30 day quick look report; on the status of the ongoing near term review at approximately the 60 day point; and then on the 90 day culmination of the near term efforts. Additional specific subject matter briefings and additional voting items that request Commission policy direction may also be added during the Commission's agenda planning meetings.

(EDO)

(SECY Suspense: 30, 60, & 90 days)

Longer Term Review

- The task force's longer term review should begin as soon as NRC has sufficient technical information from the events in Japan with the goal of no later than the completion of the 90 day near term report, and the task force should provide updates on the beginning of the longer term review at the 30 and 60 day status updates.
- This effort would include specific information on the sequence of events and the status of equipment during the duration of the event.
- The task force should evaluate all technical and policy issues related to the event to identify potential research, generic issues, changes to the reactor oversight process, rulemakings, and adjustments to the regulatory framework that should be conducted by NRC.
- The task force should evaluate potential interagency issues such as emergency preparedness.
- Applicability of the lessons learned to non-operating reactor and non-reactor facilities should also be explored.
- During the review, the task force should receive input from and interact with all key stakeholders.
- The task force should provide a report with recommendations, as appropriate, to the Commission within six months from the start of the evaluation for Commission policy direction.
- The report would be released to the public per normal Commission processes (including its transmission to the Commission as a Notation Vote Paper).
- Before beginning work on the longer term review, staff should provide the Commission with estimated resource impacts on other regulatory activities.
- The ACRS should review the report as issued in its final form and provide a letter report to the Commission.

(EDO)

(SECY Suspense: 9 months, if needed)

cc: Commissioner Svinicki
Commissioner Apostolakis
Commissioner Magwood
Commissioner Ostendorff
OGC
CFO
OCA
OPA
Office Directors, Regions, ACRS, ASLBP (via E-Mail)
PDR

From: LIA10 Hoc
Sent: Thursday, March 24, 2011 2:10 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: Nikkei article 2011/3/24 22:25
Attachments: image001.jpg

Pressure could no longer be controlled in the containment vessels protecting the reactors following damage due to the Great East Japan Earthquake at Fukushima Daiichi and Daini NPSs. Fukushima Daiichi Unit 1 is thought to have undergone core meltdown; this is the worst accident in Japanese nuclear power history.

Some measured doses above normal values but no impact on health

2011/3/24 22:25

Radiation doses across Japan

Units: microsieverts per hour (1/1000 mSv/h)

Observation point / Value for 4pm-5pm, March 24 / Ordinary times

List of cities: Sapporo, Akita, Yamagata, Mito, Utsunomiya, Maebashi, Saitama, Ichihara (Chiba pref.), Shinjuku ward (Tokyo), Nagoya, Osaka, Dazaifu (Fukuoka pref.)

Note: based on MEXT figures (Ministry of Education, Culture, Sports, Science and Technology)

各地の放射線量

単位はマイクロ(千分の1ミリ)シーベルト毎時

観測地点	24日午後4~5時 時点の値	平常時
札幌市	0.028	0.020~0.105
秋田市	0.035	0.022~0.086
山形市	0.082	0.025~0.082
水戸市	0.297	0.036~0.056
宇都宮市	0.130	0.030~0.067
前橋市	0.087	0.017~0.045
さいたま市	0.113	0.031~0.060
千葉県市原市	0.096	0.022~0.044
東京都新宿区	0.136	0.028~0.079
神奈川県茅ヶ崎市	0.092	0.035~0.069
名古屋市	0.040	0.035~0.074
大阪市	0.043	0.042~0.061
福岡県太宰府市	0.036	0.034~0.079

(注)文科省の資料をもとに作成

On March 24, MEXT published measured levels of radiation in air of the 47 prefectures of Japan. As for March 23, portions of the Tohoku and Kanto regions had values above normal. All values were below the level at which there would be any effect on health.

KKKK-87

The highest reading for 4pm to 5pm was 0.297 microsieverts/hr (1/1000 mSv/hr) at Mito city or 8 times the normal value. Readings in the Kinki, Hokuriku, Shikoku and Kyushu areas were within normal ranges.

Fukushima Prefecture uses a different method than MEXT to measure radiation at distances greater than 20km from Fukushima Daiichi NPS. The highest reading was 11.5 microsieverts/hr at Iitate village. Miyagi Prefecture also took measurements at seven locations in its jurisdiction, the highest being 0.56 microsieverts/hr at Yamamoto town.

The standard limit for a yearly radiation dose for the public is 1 mSv, excluding natural radiation, X-rays and so forth. Health is thought to be adversely impacted when a dose of 100 mSv or more is received at one time.

東京電力の福島第1原子力発電所と同第2原発が東日本巨大地震で被災、原子炉を守る格納容器内の圧力を制御できなくなるという事態が起きた。第1原発1号機は炉心溶融を起こしているとみられ、日本の原発史上最悪の原子力事故となった。

放射線量、一部で平常値超え測定 健康に影響なし

2011/3/24 22:25

各地の放射線量

単位はマイクロ(千分の1ミリ)シーベルト毎時

観測地点	24日午後4～5時 時点の値	平常時
札幌市	0.028	0.020～0.105
秋田市	0.035	0.022～0.086
山形市	0.082	0.025～0.082
水戸市	0.297	0.036～0.056
宇都宮市	0.130	0.030～0.067
前橋市	0.087	0.017～0.045
さいたま市	0.113	0.031～0.060
千葉県市原市	0.096	0.022～0.044
東京都新宿区	0.136	0.028～0.079
神奈川県茅ヶ崎市	0.092	0.035～0.069
名古屋市	0.040	0.035～0.074
大阪市	0.043	0.042～0.061
福岡県太宰府市	0.036	0.034～0.079

(注)文科省の資料をもとに作成

文部科学省が24日に公表した全国47都道府県の大気中にある放射線の測定結果によると、東北や関東地方の一部で23日に続き平常値を超える線量が測定された。いずれも健康被害につながる水準より少ない値だった。

午後4～5時の時点で最も数値が高かったのは水戸市の毎時0.297マイクロ（マイクロは1千分の1ミリ）シーベルト。平常値の8倍だった。近畿や北陸、四国や九州などは平常値の範囲に収まっていた。

福島県は文科省とは別の方法で福島第1原子力発電所から20キロメートル以上離れた地点で放射線量を測定。午後7時の測定で最高値は飯舘村の毎時11.5マイクロシーベルト。また、宮城県が24日に県内7カ所を測定したところ、最高値は山元町の毎時0.56マイクロシーベルトだった。

一般の人が浴びる放射線量の基準値は、自然の放射線や医療用X線などを除いて年間1ミリシーベルトまで。健康被害が生じるのは一度に100ミリシーベルト以上を浴びた場合とされる。

From: LIA02 Hoc
Sent: Thursday, March 24, 2011 5:04 AM
To: Foggie, Kirk; Smith, Brooke
Cc: LIA03 Hoc
Subject: Please call prior to 8:00 p.m. Japan time with your meetings for 3/24!

Hi guys: If you have time please call in before 8:00 p.m. Tokyo time. I'll be here until 7am (8pm Japan time) and then passing the coverage to Lance and Steve Bloom!

For today Janice and Jenny T will pick up at 3:00 p.m. and Elizabeth will be here at 11:00 p.m.

Mugeh

KKKK-88

From: LIA07 Hoc
Sent: Friday, March 25, 2011 7:09 PM
Subject: Resent: 1800 EDT (March 25, 2011) USNRC Earthquake/Tsunami Status Update
Attachments: USNRC Earthquake-Tsunami Update 032511 1800EDT(rev).pdf

Resent to remove the "Draft" watermark.

Attached, please find an 1800 EDT (March 25, 2011) status update from the US Nuclear Regulatory Commission's Emergency Operations Center regarding the impacts of the earthquake/tsunami.

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

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

-Sara

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

KKK15-89

From: LIA02 Hoc
Sent: Friday, March 25, 2011 8:54 AM
To: Hoc, PMT12
Cc: LIA03 Hoc; LIA08 Hoc; LIA06 Hoc
Subject: Ambassador Davies in Vienna

We are trying to keep Ambassador Davies in Vienna up to date and noticed that on the latest situation report it stated:

On March 24, 2011, the NRC recommended to OSTP, NARAC, and DOE that NARAC run a new Tokyo case. The RASCAL source terms were based upon the following major assumptions: Unit 1: assumed 70% core melt as provided by NRC RST and a 10% release rate/day as provided by the Japanese (translated report). Unit 2: assumed 33% core melt as before and a 5 in² hole in containment based on Japanese report. Unit 3: assumed 33% core melt as before and a 100% release rate/day based upon data provided by the Japanese. **NRC held a teleconference with NARAC at 2230 on March 24, 2011 to confirm the above. NARAC results should be available on March 25, 2011 as directed by the White House.**

The PMT has begun efforts to compile a comprehensive list of all PMT Rascal runs conducted since the onset of the crisis in Japan that have been supplied to NARAC. Runs are summarized in a matrix by date and reactor unit/ spent fuel pool, and percent fuel melt. Furthermore, the PMT is trending exposure rate data around the site based on Ministry of Education, Culture, Sports, Science and Technology (MEXT) data which is periodically sent to the PMT. **The exposure rate data is being presented in a figure illustrating locations and trend data.**

Please provide us this information so we can forward to our contact in Vienna.

Thank you,

Steve

Scott, Michael

From: Scott, Michael
Sent: Monday, March 14, 2011 11:16 AM
To: Gibson, Kathy
Subject: RE: Casper will be in this afternoon
Attachments: image001.jpg

This is a very fluid situation. PMT is fully stood up, RST partially. Call this morning for folks with BWR severe accident background to go to Ops Cen. Jason went over. We are working on obtaining additional resources, including from labs; some may go to Japan. Will keep you posted.

From: Gibson, Kathy
Sent: Monday, March 14, 2011 10:06 AM
To: Greenwood, Carol; Scott, Michael
Subject: Re: Casper will be in this afternoon

Thanks!

Mike, do we know who all from our staff is scheduled to work in the Ops Center and what their schedules are? It seems we should have this information either from the ops center or maybe survey the BCs.

From: Greenwood, Carol
To: Gibson, Kathy; Scott, Michael
Sent: Mon Mar 14 09:57:38 2011
Subject: FW: Casper will be in this afternoon

FYI

From: Greenwood, Carol
Sent: Monday, March 14, 2011 8:35 AM
To: Bush-Goddard, Stephanie; Lewis, Doris
Subject: Casper will be in this afternoon

He worked in the OP Center yesterday from 3pm to midnight so he needs to catch up on his sleep...

Regards

Carol Greenwood

Lead Administrative Assistant
RES/DSA
U.S. Nuclear Regulatory Commission
Phone: 301-251-3319



KKKK-90

From: RST01 Hoc
Sent: Friday, March 25, 2011 10:14 PM
To: Hoc, PMT12; PMT07 Hoc
Subject: FW: Measurements of contaminated water in Unit 1
Attachments: 3-26-11 NISA news release-1.docx; 20110326001-1.pdf; 20110326001-2.pdf

PMT,

Please see the attached radionuclide data from Accumulated Water in the Basement of Turbine Building of Fukushima Daiichi Nuclear Power Plant Unit 1. Please let us know where you hypothesize the source of the water is.

Thanks,

Brett
RST Coordinator

From: LIA03 Hoc
Sent: Friday, March 25, 2011 8:07 PM
To: RST01 Hoc
Subject: FW: Measurements of contaminated water

Bret,
I hope you find this information helpful.

Thanks!
-Jenny

From: LIA10 Hoc
Sent: Friday, March 25, 2011 8:05 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: Measurements of contaminated water

Both original Japanese document and English translation
On measurements of contaminated water attached.

News Release

Ministry of Economy, Trade and Industry

March 26, 2011

Nuclear Industrial and Science Agency

Regarding Measurement Results on Accumulated Water in the
Basement of Turbine Building of
Fukushima Daiichi Nuclear Power Plant Unit 1

Regarding the subject matter, Tokyo Electric Power Company reported on the measurements of concentration of each nuclide, so we hereby inform you of the results as attached.

Names of the elements described in the attached sheet are as follows.

Cl: chlorine

As: arsenic

Y: yttrium

I: iodine

Cs: cesium

La: lanthanum

(For inquiry on this announcement-related materials)

Nuclear Industrial and Science Agency

Nuclear Power Safety Public Relations Division: Watanabe, Oyamada

Tel: 03-3501-1505

03-3501-5890

March 25, 2011
Tokyo Electric Power Company
Fukushima Daiichi Nuclear Power Plant

Measurement Results on Accumulated Water in the
Basement of Turbine Building of
Fukushima Daiichi Nuclear Power Plant Unit 1

Nuclides	Concentration (Bq/cm ³)
Cl-38	1.6×10^6
As-74	3.9×10^2
Y-91	5.2×10^4
I-131	2.1×10^5
Cs-134	1.6×10^5
Cs-136	1.7×10^4
Cs-137	1.8×10^8
La-140	3.4×10^2

End

平成23年3月26日

原子力安全・保安院

福島第一原子力発電所1号機タービン建屋地下の 溜まり水の測定結果について

標記事案に関し、東京電力より各核種の濃度測定結果が報告されましたので、別添の通りお知らせ致します。

※ なお、別添の表に記載されている核種の元素名は以下のとおりです。

C l : 塩素

A s : ヒ素

Y : イットリウム

I : ヨウ素

C s : セシウム

L a : ランタン

(本発表資料のお問い合わせ)

原子力安全・保安院

原子力安全広報課：渡邊、小山田

電話：03-3501-1505

03-3501-5890

平成 23 年 3 月 25 日
東京電力株式会社
福島第一原子力発電所

福島第一原子力発電所 1 号機タービン建屋地下の溜まり水の測定結果について

核種	濃度 (Bq/cm ³)
Cl-38	1.6×10^6
As-74	3.9×10^2
Y-91	5.2×10^4
I-131	2.1×10^6
Cs-134	1.6×10^5
Cs-136	1.7×10^4
Cs-137	1.8×10^6
La-140	3.4×10^2

以 上

From: RST01 Hoc
Sent: Friday, March 25, 2011 5:27 AM
To: LIA10 Hoc
Subject: FW: Revision to the NISA "cooling methods" document
Attachments: 110323原子炉冷却対策Rev1.doc; 110324_原放_福島注水放射能試算.doc

Can you pls make the below changes to the document you translated earlier, verify that there are no further changes, and resend it to me?

Thanks!

Tom Boyce
RST Coordinator

-----Original Message-----

From: Nakanishi, Tony
Sent: Friday, March 25, 2011 4:21 AM
To: RST01 Hoc; PMT01 Hoc
Subject: Revision to the NISA "cooling methods" document

It appears that the only revision to the "cooling methods" document was to correct the H2 production rate (shown in red in the attachment).

The second file appears to document the dose calculations for the D/W vent valves and the temporary pit.

Tony

Tony

I corrected error of Hydrogen production rate by radiation, Unit #1 1.2kg/h Unit #2, #3 1.7kg/h

And

We estimated dose rate of reactor water.
100Sv/h on water level
10Sv/h at 1m higher than water level.

KKKK-93

福島 1-3 号炉 D/W ベント管及び仮設ピットからの線量率試算

1. 主な計算条件

- ・ 炉心出力：2428 (2380×1.02) MWt
- ・ 炉心放射エネルギーは既存計算値を出力補正して算定。
- ・ 流出水中への放射性核種移行割合（設置許可申請ベース）

希ガス : 0

ハロゲン (I、Br) : 0.5

その他固形分 : 1.0

2. 流出水中の放射エネルギー

減衰時間に対する放射エネルギーを表. 1 に示す。水量（例えば 3500m³）で割ることにより放射エネルギー濃度となる。

3. D/W ベント管からの線量率

D/W ベント配管（外径 355.6mm、肉厚 11.1mm、長さ 5m）を円筒線源として、Pre/GAM-D コード（QAD コードの PC 版）を用いて配管表面及び表面から 1 m における線量率を求める。結果を図. 1 に示す。

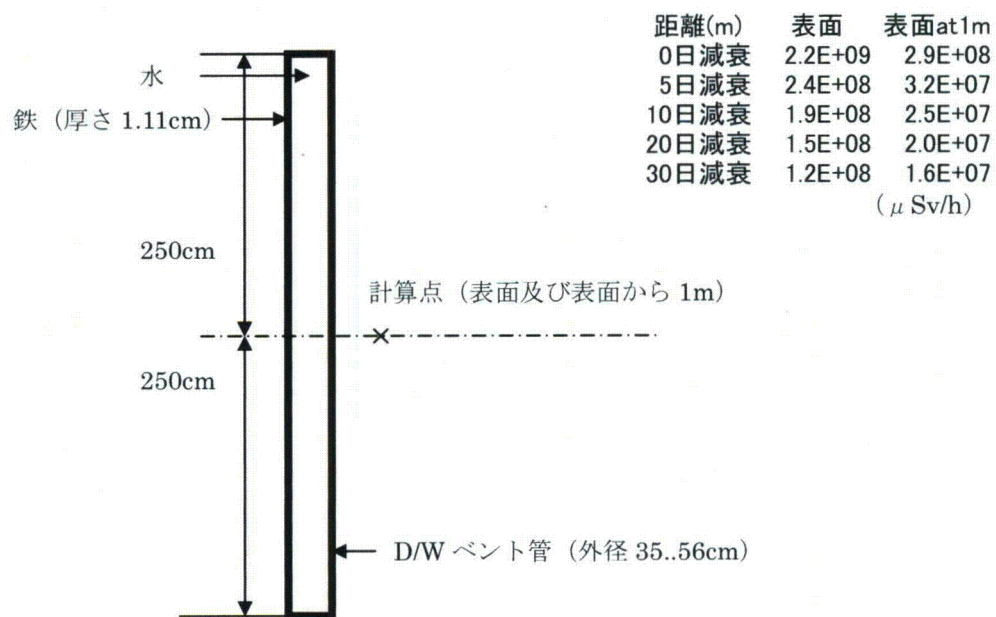
4. 仮設ピットからの線量率

流出水を満水とした仮設ピット（縦 100m、横 100、深さ 10m）を直方体線源として、Pre/GAM-D コード（QAD コードの PC 版）を用いてピット中心上方及びピット側方床上 1m における線量率を求める。結果を図. 2 に示す。

なお、ピット側方床上 1m の線量率は、土の遮蔽効果により距離が離れるに伴い急激に減少しているが、スカイシャイン線の影響を考慮すると 40～50m の距離で数桁程度は増加するものとする。

表. 1 流出水中の放射エネルギーの時間変化

No	核種	炉心放射エネルギー		液相放射エネルギー		放射エネルギー(Bq)の時間変化					
		(Bq)	(Bq)	存在割合	(Bq)	0日	1日	5日	10日	20日	30日
1 SE-81		2.7E+20	1.7E+17	1.0	1.7E+17	1.7E+17	5.4E-07	5.6E-101	1.9E-218	0.0E+00	0.0E+00
4 BR-82		2.2E+19	1.2E+14	0.5	6.0E+13	2.0E+13	3.7E+13	2.7E+12	5.4E+11	4.8E+09	4.3E+07
6 SE-83		2.9E+20	1.5E+17	1.0	1.5E+17	1.5E+17	5.5E-03	9.7E-81	6.2E-178	0.0E+00	0.0E+00
7 BR-83		5.1E+21	4.1E+17	0.5	2.1E+17	2.1E+17	2.0E+14	1.8E+02	1.6E-13	1.3E-43	1.0E-73
8 KR-83M		3.9E+21	4.1E+17	0.0	0.0E+00	0.0E+00	5.7E+14	5.9E+02	5.2E-13	4.1E-43	3.3E-73
10 BR-84		2.1E+21	7.5E+17	0.5	3.8E+17	3.8E+17	8.8E+03	2.6E-51	1.8E-119	8.9E-256	0.0E+00
13 KR-85M		2.4E+22	1.0E+18	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
14 KR-85		1.8E+25	3.7E+16	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
17 KR-87		1.3E+22	2.0E+18	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
20 RB-89		4.9E+21	3.8E+18	1.0	3.8E+18	3.8E+18	9.2E-11	3.3E-125	2.8E-268	0.0E+00	0.0E+00
21 SR-89		2.4E+25	3.8E+18	1.0	3.8E+18	3.8E+18	7.4E+18	7.0E+18	6.6E+18	5.7E+18	5.0E+18
26 SR-91		2.3E+23	4.6E+18	1.0	4.6E+18	4.6E+18	8.2E+17	8.2E+14	1.4E+11	4.5E+03	1.4E-04
27 Y-91M		1.2E+22	2.8E+18	1.0	2.8E+18	2.8E+18	7.7E+16	7.7E+13	1.4E+10	4.3E+02	1.3E-05
28 Y-91		3.3E+25	4.6E+18	1.0	4.6E+18	4.6E+18	8.3E+18	8.7E+18	8.2E+18	7.3E+18	8.5E+18
30 SR-92		6.5E+22	4.6E+18	1.0	4.6E+18	4.6E+18	1.0E+16	2.2E+05	1.0E-08	2.2E-35	4.9E-82
31 Y-92		6.5E+22	4.6E+18	1.0	4.6E+18	4.6E+18	1.8E+17	1.5E+09	9.5E-02	3.7E-22	1.4E-42
32 Y-93		2.6E+23	4.9E+18	1.0	4.9E+18	4.9E+18	9.7E+17	1.4E+15	4.0E+11	3.2E+04	2.5E-03
33 ZR-93		4.5E+26	6.4E+12	1.0	6.4E+12	6.4E+12	6.4E+12	6.4E+12	6.4E+12	6.4E+12	6.4E+12
35 Y-94		8.1E+21	5.0E+18	1.0	5.0E+18	5.0E+18	3.3E-05	6.2E-98	7.7E-214	0.0E+00	0.0E+00
36 ZR-95		4.0E+25	5.0E+18	1.0	5.0E+18	5.0E+18	4.9E+18	4.7E+18	4.5E+18	4.0E+18	3.6E+18
37 NB-95M		2.3E+22	5.0E+16	1.0	5.0E+16	5.0E+16	9.1E+16	1.9E+17	2.3E+17	2.4E+17	2.2E+17
38 NB-95		2.2E+25	5.0E+18	1.0	5.0E+18	5.0E+18	4.9E+18	4.6E+18	4.2E+18	3.4E+18	2.8E+18
39 ZR-97		4.1E+23	4.6E+18	1.0	4.6E+18	4.6E+18	1.7E+18	3.4E+16	2.5E+14	1.3E+10	7.0E+05
41 NB-97		2.9E+22	4.6E+18	1.0	4.6E+18	4.6E+18	1.3E+17	2.6E+15	1.9E+13	1.0E+09	5.4E+04
42 MO-99		1.6E+24	4.8E+18	1.0	4.8E+18	4.8E+18	3.7E+18	1.3E+18	3.8E+17	3.1E+16	2.5E+15
43 TC-99M		1.3E+23	4.2E+18	1.0	4.2E+18	4.2E+18	6.0E+17	1.4E+17	3.8E+16	3.1E+15	2.5E+14
45 MO-101		5.0E+21	3.9E+18	1.0	3.9E+18	3.9E+18	8.4E-12	1.7E-130	7.8E-279	0.0E+00	0.0E+00
46 TC-101		4.8E+21	3.9E+18	1.0	3.9E+18	3.9E+18	2.6E-10	6.4E-128	2.6E-277	0.0E+00	0.0E+00
49 RU-103		2.4E+18	2.4E+18	1.0	2.4E+18	2.4E+18	2.4E+18	2.2E+18	2.0E+18	1.7E+18	1.4E+18
50 RH-103M		1.2E+22	2.4E+18	1.0	2.4E+18	2.4E+18	2.4E+15	2.2E+15	2.0E+15	1.7E+15	1.4E+15
51 RU-105		1.8E+22	7.7E+17	1.0	7.7E+17	7.7E+17	1.8E+16	5.6E+09	4.1E+01	2.2E-15	1.2E-31
53 RH-105		1.4E+23	7.7E+17	1.0	7.7E+17	7.7E+17	1.0E+18	1.6E+17	1.5E+16	1.3E+14	1.2E+12
54 RH-106M		3.1E+15	2.7E+11	1.0	2.7E+11	2.7E+11	1.3E+08	7.7E-06	2.2E-22	1.8E-55	1.5E-88
57 RH-107		2.5E+20	1.3E+17	1.0	1.3E+17	1.3E+17	1.4E-03	1.8E-83	2.4E-183	0.0E+00	0.0E+00
58 PD-107		1.2E+25	4.1E+10	1.0	4.1E+10	4.1E+10	4.1E+10	4.1E+10	4.1E+10	4.1E+10	4.1E+10
59 SB-127		4.8E+22	1.0E+17	1.0	1.0E+17	1.0E+17	8.3E+16	4.1E+16	1.6E+16	2.7E+15	4.5E+14
60 TE-127M		2.3E+23	1.7E+16	1.0	1.7E+16	1.7E+16	3.3E+16	7.5E+16	9.6E+16	1.0E+17	9.9E+16
61 TE-127		4.8E+21	9.9E+16	1.0	9.9E+16	9.9E+16	1.7E+16	7.3E+13	5.8E+13	5.4E+13	5.1E+13
62 SN-128		1.3E+21	2.6E+17	1.0	2.6E+17	2.6E+17	1.2E+10	5.3E-20	1.1E-56	4.4E-130	1.8E-203
63 SB-128M		2.4E+20	2.6E+17	1.0	2.6E+17	2.6E+17	2.5E+09	1.1E-20	2.3E-57	9.4E-131	3.9E-204
64 SB-128		4.3E+20	9.1E+15	1.0	9.1E+15	9.1E+15	1.4E+15	8.9E+11	8.8E+07	8.4E-01	8.0E-09
65 TE-129M		3.9E+23	9.3E+16	1.0	9.3E+16	9.3E+16	9.1E+16	8.3E+16	7.5E+16	6.1E+16	5.0E+16
66 TE-129		2.9E+21	4.8E+17	1.0	4.8E+17	4.8E+17	1.3E+14	1.2E+14	1.1E+14	8.8E+13	7.2E+13
67 I-129		4.6E+25	6.5E+10	0.5	3.3E+10	3.3E+10	3.3E+10	3.3E+10	3.3E+10	3.3E+10	3.3E+10
69 I-130		1.2E+21	1.9E+14	0.5	9.4E+13	9.4E+13	2.4E+13	1.1E+11	1.3E+08	1.9E+02	2.7E-04
71 SB-130		7.9E+20	2.3E+17	1.0	2.3E+17	2.3E+17	2.5E+06	3.1E-38	4.2E-83	7.5E-203	0.0E+00
72 SB-131		3.9E+21	2.0E+18	1.0	2.0E+18	2.0E+18	2.9E-01	1.5E-76	1.2E-170	0.0E+00	0.0E+00
73 TE-131M		4.3E+22	2.8E+17	1.0	2.8E+17	2.8E+17	1.6E+17	1.7E+16	1.1E+15	4.2E+12	1.6E+10
74 TE-131		4.3E+21	2.0E+18	1.0	2.0E+18	2.0E+18	2.2E+15	2.4E+14	1.5E+13	5.9E+10	2.3E+08
75 I-131		2.2E+24	2.2E+18	0.5	1.1E+18	1.1E+18	1.0E+18	7.1E+17	4.6E+17	2.0E+17	8.2E+16
76 TE-132		1.3E+24	3.3E+18	1.0	3.3E+18	3.3E+18	2.6E+18	1.1E+18	3.7E+17	4.3E+16	4.9E+15
77 I-132		3.9E+22	3.3E+18	0.5	1.6E+18	1.6E+18	8.2E+16	3.4E+16	1.2E+16	1.3E+15	1.5E+14
80 TE-133M		1.5E+22	3.1E+18	1.0	3.1E+18	3.1E+18	4.6E+10	2.3E-21	1.7E-60	9.8E-139	5.6E-217
81 TE-133		2.5E+21	2.4E+18	1.0	2.4E+18	2.4E+18	1.3E+10	6.7E-22	5.0E-61	2.9E-139	1.6E-217
82 I-133		5.7E+23	5.3E+18	0.5	2.6E+18	2.6E+18	2.2E+16	8.2E+16	1.7E+15	5.7E+11	1.9E+08
83 KE-133M		4.1E+22	1.5E+17	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
84 KE-133		3.4E+24	5.3E+18	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
86 TE-134		1.9E+22	5.3E+18	1.0	5.3E+18	5.3E+18	2.2E+08	7.4E-34	1.0E-85	2.1E-189	4.1E-293
87 I-134		2.7E+22	5.9E+18	0.5	3.0E+18	3.0E+18	1.7E+10	1.8E-23	1.1E-64	4.5E-147	1.7E-229
89 I-135		1.7E+23	5.0E+18	0.5	2.5E+18	2.5E+18	2.0E+17	7.9E+12	2.5E+07	2.5E-04	2.6E-15
90 KE-135M		1.1E+21	8.2E+17	0.0	0.0E+00	0.0E+00	8.0E+15	3.2E+11	1.0E+06	1.0E-05	1.0E-16
91 KE-135		2.4E+23	5.2E+18	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
92 CS-134		1.9E+21	2.0E+13	1.0	2.0E+13	2.0E+13	2.0E+13	2.0E+13	2.0E+13	2.0E+13	2.0E+13
93 CS-135M		2.4E+18	5.3E+14	1.0	5.3E+14	5.3E+14	3.5E+06	6.8E-27	8.7E-68	1.4E-149	2.3E-231
95 CS-136		6.7E+21	4.1E+15	1.0	4.1E+15	4.1E+15	3.8E+15	3.1E+15	2.4E+15	1.4E+15	8.4E+14
97 CS-137		4.2E+26	3.1E+17	1.0	3.1E+17	3.1E+17	3.1E+17	3.1E+17	3.1E+17	3.1E+17	3.1E+17
99 KE-138		5.9E+21	4.9E+18	0.0	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
100 CS-138		1.5E+22	5.2E+18	1.0	5.2E+18	5.2E+18	5.5E+05	7.0E-47	9.4E-112	1.7E-241	0.0E+00
101 BA-139		3.8E+22	5.0E+18	1.0	5.0E+18	5.0E+18	3.0E+13	4.0E-08	3.3E-34	2.1E-86	1.4E-138
103 BA-140		7.8E+24	4.9E+18	1.0	4.9E+18	4.9E+18	4.6E+18	3.7E+18	2.8E+18	1.7E+18	9.6E+17
104 LA-140		1.0E+24	4.9E+18	1.0	4.9E+18	4.9E+18	3.5E+18	1.1E+18	5.0E+17	2.5E+17	1.5E+17
106 BA-141		7.2E+21	4.6E+18	1.0	4.6E+18	4.6E+18	8.5E-06	1.1E-100	2.4E-219	0.0E+00	0.0E+00
106 LA-141		9.3E+22	4.6E+18	1.0	4.6E+18	4.6E+18	6.6E+16	2.8E+09	1.7E+00	6.3E-19	2.3E-37
107 CE-141		1.9E+25	4.6E+18	1.0	4.6E+18	4.6E+18	4.5E+18	4.1E+18	3.7E+18	3.0E+18	2.4E+18
109 PR-142		6.6E+15	6.7E+10	1.0	6.7E+10	6.7E+10	2.8E+10	8.6E+08	1.1E+07	1.9E+03	3.1E-01
111 CE-143		8.0E+23	4.6E+18	1.0	4.6E+18	4.6E+18	2.8E+18	3.7E+17	3.0E+16	2.0E+14	1.3E+12
112 PR-143		7.8E+24	4.6E+18	1.0	4.6E+18	4.6E+18	4.4E+18	3.6E+18	2.8E+18	1.7E+18	1.0E+18
113 CE-144		1.3E+26	3.6E+18	1.0	3.6E+18	3.6E+18	3.6E+18	3.6E+18	3.6E+18	3.6E+18	3.6E+18
114 PR-144		6.3E+21	4.2E+18	1.0	4.2E+18	4.2E+18	1.5E+14	1.5E+14	1.5E+14	1.5E+14	1.4E+14
116 ND-147		2.4E+24	1.8E+18	1.0	1.8E+18	1.8E+18	1.7E+18	1.3E+18	9.4E+17	5.0E+17	2.7E+17
117 PM-147		1.1E+26	8.9E+17	1.0	8.9E+17	8.9E+17	8.9E+17	8.9E+17	8.8E+17	8.8E+17	8.7E+17
118 PM-148M		4.6E+18	9.0E+11	1.0	9.0E+11	9.0E+11	8.9E+11	8.3E+11	7.6E+11	6.4E+11	5.4E+11
119 PM-148		3.0E+18	4.5E+12	1.0	4.5E+12	4.5E+12	4.0E+12	2.4E+12	1.2E+12	3.4E+11	9.4E+10
121 ND-149		7.6E+21	8.5E+17	1.0	8.5E+17	8.5E+17	5.6E+13	1.1E-03	1.3E-24	2.0E-66	3.2E-108
122 PM-149		2.3E+23	8.5E+17	1.0	8.5E+17	8.5E+17	6.2E+17	1.8E+17	3.7E+16	1.6E+15	7.0E+13
126 ND-151		3.5E+20	3.3E+17	1.0	3.3E+17	3.3E+17	4.6E-18	1.9E-157	0.0E+00	0.0E+00	0.0E+00
127 PM-151		4.8E+22	3.3E+17	1.0	3.3E+17	3.3E+17	1.8E+17	1.8E+16	9.4E+14	2.7E+12	7.7E+09
128 SM-151		2.9E+25	7.1E+15	1.0	7.1E+15	7.1E+15	7.1E+15	7.1E+15			



D/Wベント管からの線量率

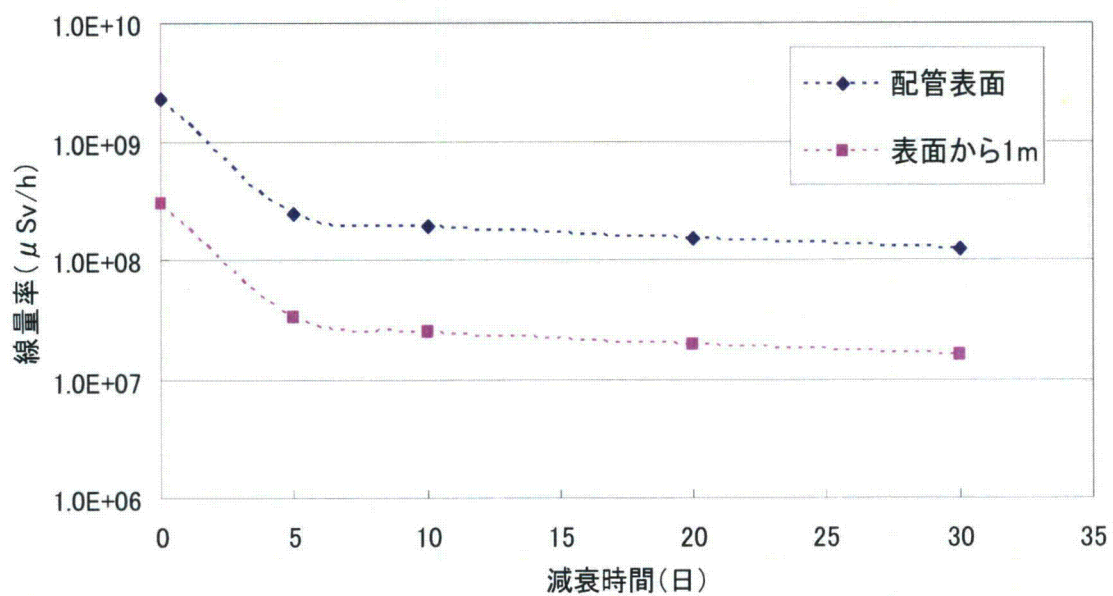
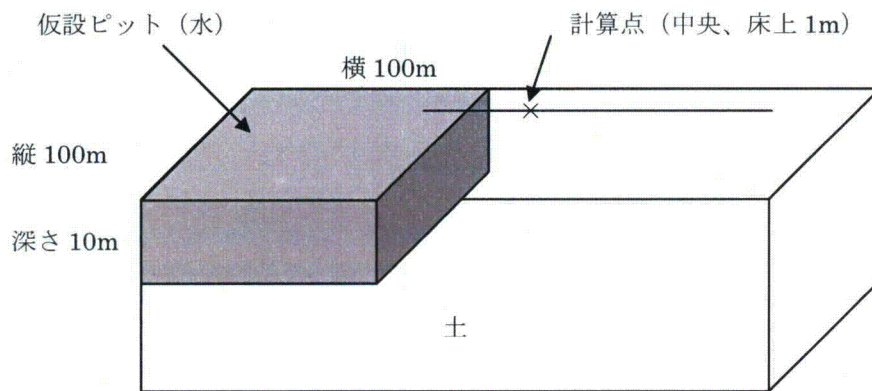
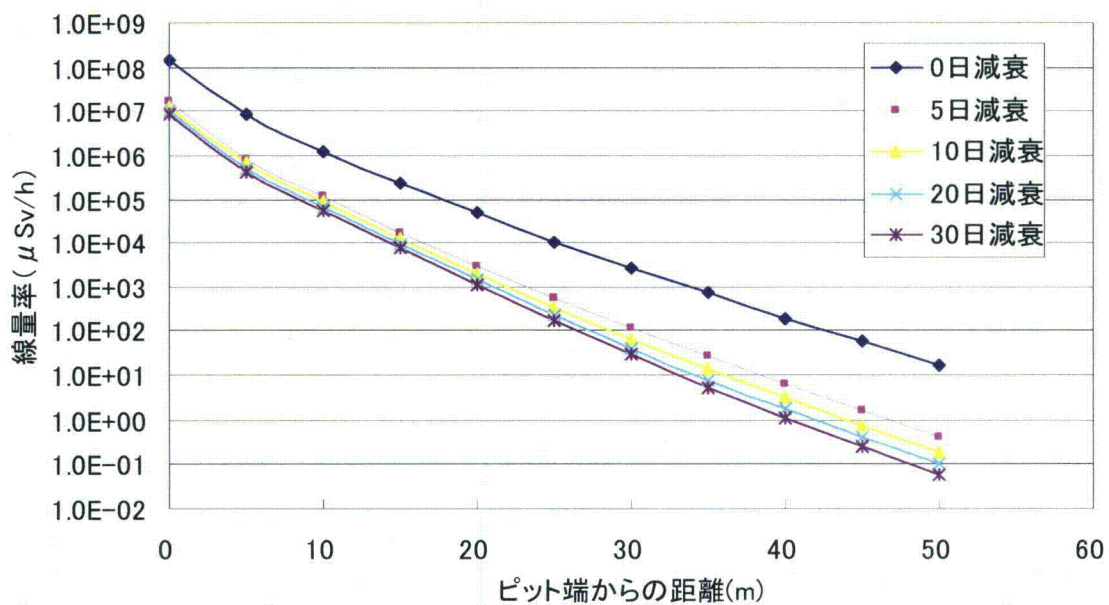


図. 1 D/W ベント管からの線量率

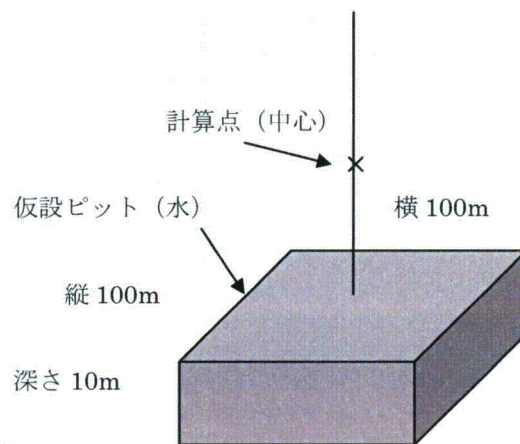


仮設ピット床上1mにおける線量率



(注) ピット側方床上1mの線量率は、土の遮へい効果により距離が離れるに伴い急激に減少しているが、スカイシャイン線の影響を考慮すると40～50mの距離で数桁程度増加するものとする。

図. 2 仮設ピットからの線量率 (側方)



仮設ピット上方の線量率

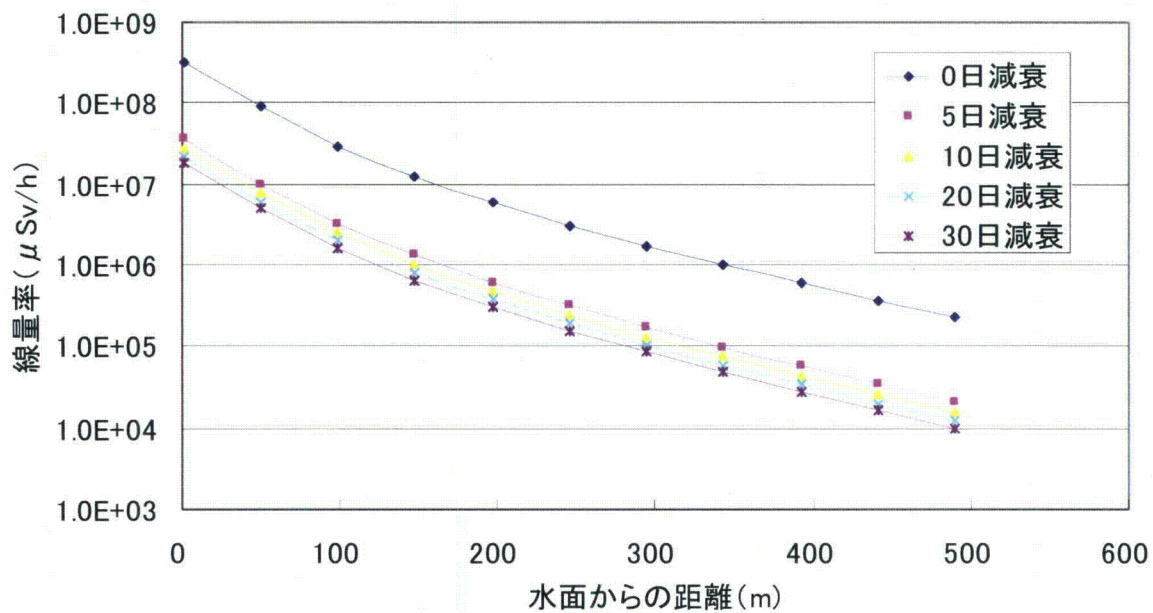


図. 2 仮設ピットからの線量率 (上方)

From: Roberts, Thomas E CIV SEA 08 NR <thomas.e.roberts@navy.mil>
Sent: Friday, March 25, 2011 7:10 PM
To: RST03 Hoc
Subject: Fw: Resent: 1800 EDT (March 25, 2011) USNRC Earthquake/Tsunami Status Update
Attachments: USNRC Earthquake-Tsunami Update 032511 1800EDT(rev).pdf

From: LIA07 Hoc <LIA07.Hoc@nrc.gov>
To: undisclosed-recipients <undisclosed-recipients:;>
Sent: Fri Mar 25 19:08:31 2011
Subject: Resent: 1800 EDT (March 25, 2011) USNRC Earthquake/Tsunami Status Update

Resent to remove the "Draft" watermark.

Attached, please find an 1800 EDT (March 25, 2011) status update from the US Nuclear Regulatory Commission's Emergency Operations Center regarding the impacts of the earthquake/tsunami.

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

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

-Sara

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

KKKK-94

From: Harrington, Holly
Sent: Friday, March 25, 2011 9:18 AM
To: LIA06 Hoc; LIA04 Hoc; LIA12 Hoc; LIA03 Hoc; LIA11 Hoc
Subject: Continue to Look for New Materials Posted on WebEOC

Just a reminder that OPA continues to use WebEOC as a central location for its new Japan-related talking points, Q&As and other materials. Please check in regularly for new material.

If you have a question about anything we've posted or have planned, please contact me.

Holly Harrington
415-8203

From: LIA10 Hoc
Sent: Saturday, March 26, 2011 5:15 AM
To: LIA02 Hoc; LIA03 Hoc
Subject: Correction re J Village - distance from Fukushima Daiichi NPP

In the report re J Village sent earlier tonight, the location of J Village is described as "about 6.5 miles south of Fukushima Daiichi NPP in Fukushima Pref."

It is actually about 12.5 miles (20 km) from Daiichi NPP, not 6.5 miles (it is 6.5 miles from Daini NPP).

Sorry for the error.

From: PMT03 Hoc
Sent: Saturday, March 26, 2011 1:40 AM
To: Rosenberg, Stacey
Cc: OST01 HOC; OST02 HOC
Subject: PMT RAAD

Stacy,

We're working to complete the PMT PAAD roster for next week. We have slots that you can assist with if you're available. The slots are Monday, 3/28 (need to fill immediately), Friday, 4/1, and Saturday, 4/2, from 3pm-11pm. If you can fill these slots (particularly Monday), please respond by copying OST01 and OST02, to be placed on the roster or let them know that you're unavailable.

Hope to see you then.

Thanks.

Lou

KKKK-97

From: LIA03 Hoc
Sent: Saturday, March 26, 2011 5:05 AM
To: LIA06 Hoc; LIA08 Hoc
Cc: LIA02 Hoc; LIA03 Hoc
Subject: FW: **CORRECTION**J Village from Japanese language information

J-Village is 12.5 miles south of Daiichi. Please disregard the previous version of this message.

From: LIA10 Hoc
Sent: Saturday, March 26, 2011 2:28 AM
To: LIA02 Hoc; LIA03 Hoc
Subject: J Village from Japanese language information

3/26/2011
Translator team

RE: J Village (Japan Football Village Co. Inc.)

J Village is about 12.5 miles south of Fukushima Daiichi NPP in Fukushima Prefecture. Information on J Village after 3/11 is very limited. The translators read more than a dozen Japanese newspaper and other articles but none of them describes how J Village facilities are being used today in any details by different emergency response entities.

The last message on J Village website from its management is dated 3/14, which thanks general public their concerns over safety of the Village employees and reports that every staff was accounted for. The site mentions that because the compound is located in the evacuation area, all the employees had to leave for safety. According to their blog, no land line telephones are working as of 3/21.

In terms of damages the facility suffered from the earthquake, the website mentions that some upheaval in the field was the only visible damage found and they did not see any major problems in their buildings.

Most newspaper articles that mention J Village are related to some specific tasks carried out by teams from SDF, Tokyo Fire Department and TEPCO, i.e., "the teams went back to the compound after their hard work" or when their work was suspended for different reasons. J Village are also mentioned in the context of Fukushima visits by government leaders, including PM and governors.

According some reports, various types of vehicles such as fire trucks, "Decontamination System" vehicle, Model 74 tanks are positioned in J Village.

From: LIA07 Hoc
Sent: Saturday, March 26, 2011 11:14 PM
To: Borchardt, Bill; Bradford, Anna; Cohen, Shari; Collins, Elmo; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Jaczko, Gregory; Johnson, Michael; Leeds, Eric; Loyd, Susan; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walls, Lorena; Weber, Michael
Cc: LIA07 Hoc
Subject: Go Book Update 2200 EDT March 26, 2011
Attachments: March 26 2200 EDT one pager.doc

Please find attached the latest "One Pager" (2200 EDT, March 26, 2011).

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

-Jim

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

From: LIA10 Hoc
Sent: Saturday, March 26, 2011 9:28 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: METI-NISA News Release 55 Japanese text and English translation
Attachments: METI News Release 55.docx; METI News Release 55-J.pdf

METI-NISA News Release 55 Japanese text and English translation attached.

KKKK-100

News Release

Ministry of Economy, Trade and Industry
March 26, 2011
Nuclear and Industrial Safety Agency

Seismic Damage Information (the 55th Release)
(As of 18:30 March 26th, 2011)

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

Major updates are as follows.

1. Nuclear Power Station-related

Fukushima Dai-ichi Nuclear Power Station

Lighting in the Central Operation Room was recovered. (16:46 March 26th)

2. Industry safety-related

See attached sheet

(Attached sheet)

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

Fukushima Dai-ichi NPS, TEPCO

(Okuma Town and FutabaTown, Futaba County, Fukushima Prefecture)

(1) The state of operation

Unit 1 (460MWe): automatic shutdown

Unit 2 (784MWe): automatic shutdown

Unit 3 (784MWe): automatic shutdown

Unit 4 (784MWe): in periodic inspection outage

Unit 5 (784MWe): in periodic inspection outage, cold shutdown at 14:30 March 20th

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

(2) Status of monitoring

See separate attachement

(3) Major Plant Parameters (As of 14:00 March 26th)

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Reactor pressure *1 [MPa]	0.452 (A) 0.481 (B)	0.074 (A) 0.074 (B)	0.139 (A) 0.000 (C)	--	0.108	0.104
Containment vessel pressure (D/W) [kPa]	275	110	106.8	--	--	--
Reactor water level *2 [mm]	-1650 (A) -1600 (B)	-1200 (A) Unknown (B)	-1850 (A) -2300 (B)	--	2123	2094
S/C water temperature inside containment vessel [°C]	--	--	--	--	--	--
S/C pressure inside containment vessel [kPa]	275	D/S	183.6	--	--	--
Spent fuel pool water temperature [°C]	--	57	--	Poor instruction	42.8	30.0

Comments	Value as of 3/26 13:00	Value as of 3/26 13:00	Value as of 3/26 11:15	Value as of 3/24 11:00	Value as of 3/26 14:00	Value as of 3/26 14:00
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*1: Converted from reading value to absolute pressure

*2: Distance from the top of fuel

(4) Situation of Each Unit

<Unit 1>

- TEPCO reported to NISA the event (Inability of water injection of the Emergency Core Cooling System) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (16:36 March 11th)
- Operation of Vent (10:17 March 12th)
- Seawater injection to the Reactor Pressure Vessel (RPV) via the Fire Extinguish Line started. (20:20 March 12th)→Temporary interruption of the injection (01:10 March 14th)
- The sound of explosion in Unit 1 occurred. (15:36 March 12th)
- The amount of injected water to the to the Reactor Core was increased by utilizing the Water Supply Line in addition to the Fire Extinguish Line. ($2\text{m}^3/\text{h} \rightarrow 18\text{m}^3/\text{h}$). (02:33 March 23rd) Later, it was switched to the Water Supply Line only (around $11\text{m}^3/\text{h}$). (09:00 March 23rd)
- Lighting in the Central Operation Room was recovered. (11:30 March 24th)
- White smoke was confirmed to generate continuously. (As of 08:00 March 26th)
- As the result of taking measurements on accumulated water in the basement of the turbine building, major nuclides, namely $2.1 \times 10^5 \text{Bq}/\text{cm}^3$ of ^{131}I (iodine) and $1.8 \times 10^6 \text{Bq}/\text{cm}^3$ of ^{137}Cs (cesium) were confirmed.
- Fresh water is being injected into RPV. (As of 18:30 March 26th)

<Unit 2>

- TEPCO reported to NISA the event (Inability of water injection of the Emergency Core Cooling System) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (16:36 March 11th)
- Operation of Vent (11:00 March 13th)
- The Blow-out Panel of reactor building was opened due to the explosion in the reactor building of Unit 3. (After 11:00 March 14th)
- Reactor Pressure Vessel water level tended to decrease. (13:18 March 14th). TEPCO reported to NISA the event (Loss of reactor cooling functions) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (13:49 March 14th)
- Seawater injection to RPV via the Fire Extinguish line continues. (As of 16:34 March 14th)
- Water level in RPV tended to decrease. (22:50 March 14th)
- Operation of Vent (0:02 March 15th)
- A sound of explosion was made in Unit 2. As the pressure in Suppression Chamber decreased (06:10 March 15th), there was a possibility that an incident occurred in the Chamber. (About 06:20 March 15th)

- Electric power receiving at the emergency power source transformer from the external transmission line was completed. The work for laying the electric cable from the facility to the load side was carried out. (As of 13:30 March 19th)
- 40 ton of seawater was injected into spent fuel pool. (Pumps of fire trucks were connected to cooling system pipes. (15:05 ~ 17:20 March 20th)
- Power Center of Unit 2 received electricity (15:46 March 20th)
- White smoke generated. (18:22 March 21st)
- White smoke was died down and almost invisible. (As of 07:11 March 22nd)
- Injection of 18t of Seawater to the Spent Fuel Pool was carried out. (From 16:07 till 17:01 March 22nd)
- Injection of seawater to the Spent Fuel Pool via the Fuel Pool Cooling Line was carried out. (From 10:30 till 12:19 March 25th)
- Seawater was injected into spent fuel pool using spent fuel pool cooling system. (10:30 – 12:19 March 25th)
- Continued generation of white smoke was confirmed. (As of 8:00 March 26th)
- Lighting in the Central Operation Room was recovered. (16:46 March 26th)
- Fresh water is being injected into RPV. (As of 18:30 March 26)

<Unit 3>

- TEPCO reported to NISA the event (Inability of water injection of the Emergency Core Cooling System) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (05:10 March 13th)
- Operation of Vent (20:41 March 12th)
- Operation of Vent (09:20 March 13th)
- Fresh water started to be injected to RPV via the Fire Extinguish Line. (11:55 March 13th)
- Seawater started to be injected to RPV via the Fire Extinguish Line. (13:12 March 13th)
- Seawater injection for Units 1 and 3 was interrupted due to the lack of seawater in pit. (01:10 March 14th)
- Seawater injection to RPV for Unit 3 was restarted. (03:20 March 14th)
- Operation of Vent (05:20 March 14th)
- The pressure in Primary Containment Vessel (PCV) of Unit 3 rose unusually. (07:44 March 14th) TEPCO reported to NISA on the event falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (7:52 March 14th)
- In Unit 3, the explosion like Unit 1 occurred around the reactor building (11:01 March 14th)
- The white smoke like steam generated from Unit 3. (08:30 March 16th)
- Because of the possibility that PCV of Unit 3 was damaged, the workers evacuated from the main control room of Units 3 and 4 (common control room). (10:45 March 16th) Thereafter the operators returned to the room and restarted the operation of water injection. (11:30 March 16th)
- Seawater was discharged 4 times to Unit 3 by the helicopters of the Self-Defense Force. (9:48, 9:52, 9:58 and 10:01 March 17th)
- The riot police arrived at the site for the water spray from the grand. (16:10 March 17th)

- The Self-Defense Force started the water spray using a fire engine. (19:35 March 17th)
- The water spray from the ground was carried out by the riot police. (From 19:05 till 19:13 March 17th)
- The water spray from the ground was carried out by the Self-Defense Force using 5 fire engines. (19:35, 19:45, 19:53, 20:00 and 20:07 March 17th)
- The water spray from the ground using 6 fire engines (6 tons of water spray per engine) was carried out by the Self-Defense Force. (From before 14:00 till 14:38 March 18th)
- The water spray from the ground using a fire engine provided by the US Military was carried out. (Finished at 14:45 March 18th)
- Hyper Rescue Unit of Tokyo Fire Department carried out the water spray. (Finished at 03:40 March 20th)
- The pressure in PCV of Unit 3 rose (320 kPa as of 11:00 March 20th). Preparation to lower the pressure was carried. Judging from the situation, immediate pressure relief was not required. Monitoring the pressure continues (120 kPa at 12:15 March 21st).
- On-site survey for leading electric cable (From 11:00 till 16:00 March 20th)
- Water spray over the Spent Fuel Pool of Unit 3 by Hyper Rescue Unit of Tokyo Fire Department was carried out (From 21:30 March 20th till 03:58 March 21st).
- Grayish smoke generated from Unit 3. (At around 15:55 March 21st)
- The smoke was confirmed to be died down. (17:55 March 21st)
- Grayish smoke changed to be whitish and seems to be ceasing. (As of 07:11 March 22nd)
- Water spray (Around 180t) by Hyper Rescue Unit of Tokyo Fire Department was carried out. (from 15:10 till 16:00 March 22nd)
- Lighting was recovered in the Central Operation Room. (22:43 March 22nd)
- Injection of 35t of seawater to the Spent Fuel Pool via the Fuel Pool Cooling Line was carried out. (From 11:03 till 13:20 March 23rd)
- Slightly blackish smoke generated from the reactor building. (Around 16:20 March 23rd) At around 23:30 March 23rd and around 4:50 March 24th, it was reported that the smoke seemed to cease.
- Around 120t of seawater was injected to the Spent Fuel Pool via the Fuel Pool Cooling Line. (From around 5:35 till around 16:05 March 24th)
- Kawasaki City Fire Department sprayed water with support from Tokyo Fire Department. (From 13:28 till 16:00 March 25th)
- Continuous generation of white smoke confirmed. (As of 8:00 March 26th)
- Fresh water is being injected into RPV. (As of 18:30 March 26th)

<Unit 4>

- Because of the replacement work of the Shroud of RPV, no fuel was inside the RPV.
- The temperature of water in the Spent Fuel Pool had increased. (84°C at 04:08 March 14th)
- It was confirmed that a part of wall in the operation area of Unit 4 was damaged. (06:14 March 15th)
- The fire at Unit 4 occurred. (09:38 March 15th) TEPCO reported that the fire was extinguished spontaneously. (11:00 March 15th)

- The fire occurred at Unit 4. (5:45 March 16th) TEPCO reported that no fire could be confirmed on the ground. (At around 06:15 March 16th)
- The Self-Defense Force started water spray over the Spent Fuel Pool of Unit 4 (09:43 March 20th).
- On-site survey for leading electric cable (From 11:00 till 16:00 March 20th)
- Water spray over the Spent Fuel Pool of Unit 4 by Self-Defense Force was started. (From around 18:30 till 19:46 March 20th).
- Water spray over the Spent Fuel Pool by Self-Defense Force using 13 fire engines was started (From 06:37 till 08:41 March 21st).
- Works for laying electricity cable to the Power Center was completed. (At around 15:00 March 21st)
- Power Center received electricity. (10:35 March 22nd)
- Spray of around 150t of water using Concrete Pump Truck (50t/h) was carried out. (from 17:17 till 20:32 March 22nd)
- Spray of around 130t of water using Concrete Pump Truck (50t/h) was carried out. (From 10:00 till 13:02 March 23rd)
- Spray of around 150t of water using Concrete Pump Truck (50t/h) was carried out. (From 14:36 till 17:30 March 24th)
- Spray of water using Concrete Pump Truck (50t/h). (From 19:05 till 22:07 March 25th)
- Injection of seawater to the Spent Fuel Pool via the Fuel Pool Cooling Line was carried out. (From 06:05 till 10:20 March 25th)
- White smoke was confirmed to generate continuously. (As of 8:00 March 26th)

<Units 5 and 6>

- The first unit of Emergency Diesel Generator (B) for Unit 6 is operating and supplying electricity. Water injection to RPV and the Spent Fuel Pool through the system of Make up Water Condensate (MUWC) is being carried out.
- The second unit of Emergency Diesel Generator (A) for Unit 6 started up. (04:22 March 19th)
- The pumps for Residual Heat Removal (RHR) (C) for Unit 5 (05:00 March 19th) and RHR (B) for Unit 6 (22:14 March 19th) started up and recovered heat removal function. It cools Spent Fuel Pool with priority. (Power supply : Emergency Diesel Generator for Unit 6) (05:00 March 19th)
- Unit 5 under cold shut down (14:30 March 20th)
- Unit 6 under cold shut down (19:27 March 20th)
- Receiving electricity reached to the transformer of starter. (19:52 March 20th)
- Power supply to Unit 5 was switched from the Emergency Diesel Generator to external power supply. (11:36 March 21st)
- Power supply to Unit 6 was switched from the Emergency Diesel Generator to external power supply. (19:17 March 22nd)
- The temporary pump for RHR Seawater System (RHRS) was automatically stopped when the power supply was switched from the temporary to the permanent. (17:24 March 23rd)

- Repair of the temporary pump for RHRS was completed (16:14 March 24th) and cooling was started again. (16:35 March 24th)
- Power source for temporary installed Residual Heat Removal System (RHRS) pumps of Unit 6 was switched from temporary installed one to permanently installed one. (15:38, 15:42 March 25th)

<Common Spent Fuel Pool>

- It was confirmed that the water level of Spent Fuel Pool was maintained full at after 06:00 March 18th.
- Water spray over the Common Spent Fuel Pool was carried out. (From 10:37 till 15:30 March 21st)
- The power was started to be supplied (15:37 March 24th) and cooling was also started. (18:05 March 24th)
- As of 8:30 March 26th, water temperature of the pool was around 46°C.

<Others>

- As the result of analysis on seawater nuclides near water spray nozzle in the south side, 5.0 X 10¹Bq/cm³ of ¹³¹I (iodine) (1250.8 times of the concentration limit in water outside perimeter monitoring zone) was detected.

Fukushima Dai-ni NPS (TEPCO)

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

(1) The state of operation

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

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

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

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

(2) Indicated values at monitoring posts, etc See attached document

(3) Major plant parameters (As of 18:00 March 26th)

	Measurement unit	Unit 1	Unit 2	Unit 3	Unit 4
Reactor pressure *1	MPa	0.15	0.12	0.11	0.13
Reactor water temperature	°C	28.9	28.5	33.3	28.9
Reactor water level *2	mm	9146	10246	8548	8785
Suppression pool water temperature	°C	25	26	26	27

inside containment vessel					
Suppression pool pressure inside containment vessel	kPa (abs)	107	106	103	105
Comments		Cold shut down	Cold shut down	Cold shut down	Cold shut down

*1: Converted from reading value to absolute pressure

*2: Distance from the top of fuel

(4) Report concerning other incidents

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

Onagawa NPS (Tohoku Electric Power Co. Inc.)

(Onagawa Town, Oga County and Ishinomaki City, Miyagi Prefecture)

(1) The state of operation Unit 1 (524MWe): automatic shutdown, cold shut down at 0:58, March 12th

Unit 2 (825MWe): automatic shutdown, cold shut down at earthquake

Unit 3 (825MWe): automatic shutdown, cold shut down at 1:17, March 12th

(2) Readings of monitoring post, etc.

MP2 (Monitoring at the North End of Site Boundary)

approx. 0.98μSV/h (16:00 March 25th) → approx. 0.86μSV/h (16:00 March 26th)

(3) Report concerning other incidents

- Fire Smoke on the first basement of the Turbine Building was confirmed to be extinguished. (22:55 on March 11th)

- Tohoku Electric Power Co. reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (13:09 March 13th)

2. Industrial Safety

Electric power (as of March 26, 19:30)

Tohoku Electric Power Company (as of March 26, 19:30)

Number of households experiencing power outage: about 190,000 households (total cumulative number of household experienced power outage: about 4.86 million households)

Outage area: Aomori Prefecture 38 partial areas (about 4 million households)

Iwate Prefecture Partial area (about 35,000 households)

Miyagi Prefecture Partial area (about 120,000 households)

Fukushima Prefecture Partial area (about 38,000 households)

Tokyo Electric Power Company

Electric power has been already restored by 01:00 March 19. (total cumulative number: about 4.05 million households)

Hokkaido Electric Power Company

Electric power has been already restored by 14:00 March 12. (total cumulative number of households experienced power outage: about 3000 households)

Chubu Electric Power Company

Electric power has been already restored by 17:11 March 12. (total cumulative number of households experienced power outage: about 400 households)

[Reference information] Power Stations currently shut down (except Nuclear Power Stations)

Tokyo Electric Power Company (as of 09:00 March 26) * Power Stations currently shut down due to earthquakes

Hirono Thermal Power Station Units 2 and 4

Hitachinaka Thermal Power Station Unit 1

Kashima Thermal Power Station Units 2,3,5 and 6

Tohoku Electric Power Company (as of 18:00 March 26)

Sendai Thermal Power Station Unit 4

New Sendai Thermal Power Station Units 1 and 2

Haramachi Thermal Power Station Units 1 and 2

City gas (as of 22:00 March 25)

Number of households to which gas supply has been suspended *about 430,000 households (total cumulative number of households to which supply has been suspended: about 500,000 households)

* Number of households to which gas supply has been suspended includes households collapsed with confirmation.

General gas (as of 22:00 March 25)

Fatal accidents: Details of cause are under investigation including implication of earthquakes.

Morioka Gas (Morioka City) 1 death, 10 injured

08:00 March 14th Explosion in the basement of a department store

Tobu Gas (Iwaki City) 1 death

11:30 March 12 Leaked gas was ignited in general residential homes

In Hokkaido, Yamagata and Akita Prefectures, there is no report of suspension of supply.

Status of supply suspension for each company is as follows. (Number of households collapsed with confirmation not included)

Sendai City Gas Supply for 309,024 households suspended

Siogama Gas (Shiogama City) Supply for 9,515 households suspended

Kamaishi Gas (Kamaishi City) Supply for 6,342 households suspended

Tokiwa-Kyodo Gas (Iwaki City) Supply for 11,055 households suspended

Kyoba Gas (Urayasu City) Supply for 3,696 households suspended

Tohoku Gas (Shirakawa City) Supply for 35 households suspended

Tokiwa Toshi Gas (Iwaki City) Supply for 362 households suspended

Kesennuma City Gas (Kesennuma City) Supply for 1,400 households suspended

Ishimaki Gas (Ishimaki City) Supply for 14,771 households suspended

Community gas (as of 22:00 March 25) (Number of households collapsed with confirmation not included)

Status of supply suspension of each company is as follows.

Miyagi Gas (Sendai City) Supply for 2,058 households suspended

(Tomitani Town, Kurokawa-gun) Supply for 2,318 households suspended

Iwanuma City Agricultural Cooperative (Iwanuma City) Supply for 753 households suspended

Kamaishi Gas (Kamaishi City) Supply for 1,134 households suspended

Sendai City Gas Department (Iwanuma City) Supply for 342 households suspended

Sendai Propane (Watari-gun, Yamamoto Town) Supply for 360 households suspended

Sennan Gas (Shiraishi City) Supply for 409 households suspended

(Iwanuma City) Supply for 252 households suspended

(Shibata-gun, Shibata Town) Supply for 1,806 households suspended

Kamei (Higashi Matsushima City Yamoto Town) Supply for 243 households suspended

Iwaki Gas (Iwaki City) Supply for 594 households suspended

Soma Gas (Soma City) Supply for 143 households suspended

Mie Shokai (Ofunato City) Supply for 81 households suspended

Yagimata Shoten (Ofunato City) Supply for 105 households suspended

Natori Iwanuma Agricultural Cooperative (Iwanuma City) Supply for 586 households suspended

Gas & Life (Higashi Matsushima City) Supply for 498 households suspended

Sendai LP Gas (Sendai City) Supply for 3,594 households suspended

Supply of heat (as of 22:00 March 24)

Konahama Hot Water Distribution (Iwaki City Konahama) Supply suspended

LP gas (as of 08:00 March 25)

Fatal accident: Details of cause including implication of earthquakes are under investigation

Fukushima Prefecture Iwaki City 1 death

Morning of March 13th Gas explosion in an apartment building

Industrial complex (as of 08:00 March 25)

Cosmo Petroleum Chiba Refinery (Chiba Prefecture Ichihara City)

Support columns of LPG storage tank were broken and damaged. Gas leaked and caused fire
1 serious injury, 5 minor injuries, Fire ceased in the morning of March 21

JX Nikko Nisseki Energy Co. Sendai Refinery (Miyagi Prefecture Sendai City)

There was explosion in shipping facility area and fire started. Fire ceased in the afternoon of
March 15.

2. Action taken by NISA

(March 11th)

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

15:42 TEPCO reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

16:36 TEPCO recognized the event (Inability of water injection of the Emergency Core Cooling System) in accordance with the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Units 1 and 2 of Fukushima Dai-ichi NPS. (Reported to NISA at 16:45)

18:08 Regarding Unit 1 of Fukushima Dai-ichi NPS, TEPCO reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

18:33 Regarding Units 1, 2 and 4 of Fukushima Dai-ichi NPS, TEPCO reported to NISA in accordance with the Article 10 of Act on Special Measures Concerning Nuclear Emergency Preparedness.

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

20:50 Fukushima Prefecture's Emergency Response Headquarters issued a direction for the residents within 2 km radius from Unit 1 of Fukushima Dai-ichi NPS to evacuate. (The population of this area is 1,864.)

21:23 Directives from Prime Minister to the Governor of Fukushima Prefecture, the Mayor of Okuma Town and the Mayor of Futaba Town were issued regarding the event occurred at Fukushima Dai-ichi NPS, TEPCO, in accordance with the Paragraph 3, the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness as follows:

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

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

24:00 Vice Minister of Economy, Trade and Industry, Ikeda arrived at the Local Emergency Response Headquarters (March 12th)

05:22 Regarding Unit 1 of Fukushima Dai-ichi NPS, TEPCO recognized the event (Loss of pressure suppression function) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (Reported to NISA at 06:27)

05:32 Regarding Unit 2 of Fukushima Dai-ichi NPS, TEPCO recognized the event (Loss of pressure suppression function) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

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

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

06:50 In accordance with the Paragraph 3, the Article 64 of the Nuclear Regulation Act, the order was issued to control the internal pressure of PCV of Units 1 and 2 of Fukushima Dai-ichi NPS.

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

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

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

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

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

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

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

20:20 At Unit 1 of Fukushima Dai-ichi NPS, seawater injection started. (March 13th)

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

09:01 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

09:08 Pressure suppression and fresh water injection started for Unit 3 of Fukushima Dai-ichi NPS.

09:20 The Pressure Vent Valve of Unit 3 of Fukushima Dai-ichi NPS was opened.

09:30 Directive was issued for the Governor of Fukushima Prefecture, the Mayors of Okuma Town, Futaba Town, Tomioka Town and Namie Town in accordance with the Act on Special Measures Concerning Nuclear Emergency Preparedness on the contents of radioactivity decontamination screening.

09:38 TEPCO reported to NISA that Unit 1 of Fukushima Dai-ichi NPS reached a situation specified in the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

13:09 Tohoku Electric Power Co. reported to NISA that Onagawa NPS reached a situation specified in the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

13:12 Fresh water injection was switched to seawater injection for Unit 3 of Fukushima Dai-ichi NPS.

14:36 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS. (March 14th)

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

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

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

05:38 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

07:52 TEPCO reported to NISA the event (Unusual rise of the pressure in PCV) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 3 of Fukushima Dai-ichi NPS.

13:25 Regarding Unit 2 of Fukushima Dai-ichi NPS, TEPCO recognized the event (Loss of reactor cooling function) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

22:13 TEPCO reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

22:35 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

(March 15th)

00:00: The acceptance of experts from IAEA was decided. NISA agreed to accept the offer of dispatching of the expert on NPS damage from IAEA considering the intention by Mr. Amano, Director General of IAEA. Therefore, the schedule of expert acceptance will be planned from now on according to the situation.

00:00: NISA also decided the acceptance of experts dispatched from NRC.

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

07:24 Incorporated Administration Agency, Japan Atomic Energy Agency (JAEA) reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Nuclear Fuel Cycle Engineering Laboratories, Tokai Research and Development Centre.

07:44 JAEA reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Nuclear Science Research Institute.

08:54 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

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

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

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

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

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 in-reactor situation.

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

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

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

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

(March 18th)

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

15:55 TEPCO reported to NISA on the accidents and failure at Units 1, 2, 3 and 4 of Fukushima Dai-ichi NPS (Leakage of the radioactive materials inside of the reactor buildings to non-controlled area of radiation) pursuant to the Article 62-3 of the Nuclear Regulation Act.

16:48 Japan Atomic Power Co. reported to NISA accidents and failures in Tokai NPS (Failure of the seawater pump motor of the emergency diesel generator 2C) pursuant to the Article 62-3 of the Nuclear Regulation Act.

(March 19th)

07:44 The second unit of Emergency Diesel Generator (A) for Unit 6 started up. TEPCO reported to NISA that the pump for RHR (C) for Unit 5 started up and started to cooling Spent Fuel Storage Pool. (Power supply: Emergency Diesel Generator for Unit 6)

08:58 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

(March 20th)

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

(March 21st)

07:45 Directive titled as “Administration of the stable Iodine” was issued from Local Emergency Response Headquarters to the Prefectural Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iitate Village), which directs the above-mentioned governor and the heads to administer stable Iodine under the direction of the headquarters and in the presence of medical experts, and not to administer it on personal judgments.

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 (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iitate Village), which directs the above-mentioned governor and heads to publicly announce the guidance to the residents within the in-house evacuation zone, concerning the indoor use of heating equipments that require ventilation, in order to avoid poisoning from carbon monoxide and to reduce exposure.

17:50 Directive from the Head of Government Nuclear Emergency Response Headquarters to the Prefectural Governors of Fukushima, Ibaraki, Tochigi and Gunma was issued, which direct the above-mentioned governors to issue a request to relevant businesses and people to suspend shipment of spinach, Kakina (a green vegetable) and raw milk for the time being.

(March 22nd)

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

(March 25th)

NISA directed orally to the TEPCO regarding the exposure of workers at the turbine building of Unit 3 of Fukushima Dai-ichi Nuclear Power Station occurred on March 24th, to review

immediately and to improve its radiation control measures from the viewpoint of preventing a recurrence.

< Possibility on radiation exposure (As of 18:30 March 26th) >

1. Exposure of residents

(1) Including the about 60 evacuees from Futaba Public Welfare Hospital to Nihonmatsu City Fukushima Gender Equality Centre, as the result of measurement of 133 persons at the Centre, 23 persons counted more than 13,000 cpm were decontaminated.

(2) The 35 residents transferred from Futaba Public Welfare Hospital to Kawamata Town Saiseikai Kawamata Hospital by private bus arranged by Fukushima Prefecture were judged to be not contaminated by the Prefectural Response Centre.

(3) As for the about 100 residents in Futaba Town evacuated by bus, the results of measurement for 9 of the 100 residents were as follows. The evacuees, moving outside the Prefecture (Miyagi Prefecture), were divided into two groups, which joined later to Nihonmatsu City Fukushima Gender Equality Centre.

Radiation count	Number of people
18,000 cpm	1
30,000 ~ 36,000 cpm	1
40,000 cpm	1
Slightly less than 40,000 cpm *	1
Very low	5

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

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

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

(5) The Fukushima Prefecture carried out the evacuation of patients and personnel of the hospitals located within 10km area. The screening of all the members showed that 3 persons have the high counting rate. These members were transported to the secondary medical institute of exposure. As a result of the screening on 60 fire fighting personnel involved in the transportation activities, the radioactivity higher than twice of the back ground was detected on 3 members. Therefore, all the 60 members were decontaminated.

(6) Fukushima prefecture started screening on March 13. Screeners visited evacuation shelters and currently implementing screening at 13 sites (permanent sites) including healthcare centers. 78,813 people have been screened by March 24. There were 98 people among them on whom 100,000 cpm or higher value was detected. As those who showed 100,000 cpm or higher value were unclothed and measured again, and their reading decreased to 100,000 cpm or less. There were no cases that showed negative health impact.

2. Exposure of workers

As for the workers conducting operations in Fukushima Dai-ichi NPS, the number of people who were at the level of exposure more than 100mSv increased as three workers (All the people were the subcontractor's employees.) who were laying cables in the turbine building of Unit 3 of the NPS were confirmed to be at the level of exposure more than 170mSv. In total, the number of workers who were at the level of exposure more than 100mSv becomes 18.

For two of the three workers who were laying cables, the attachment of radioactive material on the skin of both legs was confirmed. As the two workers were judged to have a possibility of beta ray burn, they were transferred to the Fukushima Medical University Hospital on March 24th, and departed for the National Institute of Radiological Sciences in the Chiba Prefecture on March 25th. As the result of examination, their exposure dose on their feet is considered to be 2 to 6 Sv and no treatment was necessary for both internal exposure and foot exposure.

However, it was decided to place all three under observation in the hospital.

Concerning the result of survey for the water that those workers stepped in, the dose rate on the surface of the water was about 400mSv/h and, as a result of gamma ray nuclide analysis of sampled water, the concentration of radioactive nuclide of the sample was about 3.9×10^6 Bq/cm³ in total of each nuclides.

3. Others

(1) 4 members of Self-Defense Force who worked in Fukushima Dai-ichi NPS were injured by explosion. One member was transferred to National Institute of Radiological Sciences. After the examination, judged that there were wounds but no risk for health from the exposure, the one was released from the hospital on March 17th. No other exposure of the Self-Defense Force member was confirmed at the Ministry of Defense.

(2) As for policeman, the decontaminations of two policemen were confirmed by the National Police Agency. Nothing unusual was reported.

(3) On March 24th, examinations of thyroid gland for 66 children aged from 1 to 15 years old were carried out. The result was at the level of exposure of no problem.

<Directive of screening levels for decontamination of radioactivity>

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

Old : 40 Bq/cm² measured by a gamma-ray survey meter or 6,000 cpm

New : 1 μ Sv/hour (dose rate at 10cm distance) or 100,000cpm equivalent

<Directives of administrating stable Iodine during evacuation>

(1) On March 16th, the Local Emergency Response Headquarters issued "Directive to administer the stable Iodine during evacuation from the evacuation area (20 km radius)" to the Prefectural Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iidate Village).

(2) On March 21st, the Local Emergency Response Headquarters issued Directive titled as "Administration of the stable Iodine" to the Prefectural Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iidate Village), which directs the above-mentioned governor and heads to administer stable Iodine under the direction of the headquarters and in the presence of medical experts, and not to administer it on personal judgments.

<Situation of the injured (As of 18:30 March 26th)>

1. Injury due to earthquake

- Two employees (slightly)
- Two subcontract employees (one fracture in both legs)
- Two missing (TEPCO's employee, missing in the turbine building of Unit 4)
- One emergency patient (According to the local prefecture, one patient of cerebral infarction was transported by the ambulance).
- Ambulance was requested for one employee complaining the pain at left chest outside of control area (conscious).
- Two employees complaining discomfort wearing full-face mask in the main control room were transported to Fukushima Dai-ni NPS for a consultation with an industrial doctor.

2. Injury due to the explosion of Unit 1 of Fukushima Dai-ichi NPS

- 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.

3. Injury due to the explosion of Unit 3 of Fukushima Dai-ichi NPS

- Four TEPCO's employees
- Three subcontractor employees
- Four members of Self-Defence Force (one of them was transported to National Institute of Radiological Sciences considering internal possible exposure. The examination resulted in no internal exposure. The member was discharged from the institute on March 17th.)

4. Other injuries

- A person who visited the clinic in Fukushima Dai-ni NPS from a transformer sub-station, claiming of a stomach ache, was transported to a clinic in Iwaki City, because the person was not contaminated.

<Situation of resident evacuation (As of 08:00 March 25th)>

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

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

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

<Directive regarding foods and drinks>

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

(1) Products shipment and intake thereof are restricted (as of March 23)

Prefecture	Products shipment thereof is restricted	Products intake thereof is restricted
Fukushima	non-head type leafy vegetables and head type leafy vegetables, flowerhead breccias (spinach, cabbage, broccoli, cauliflower, Komatsuna (a green vegetable) ,kukidachina, nobuohuyona, aburana, chijirena, santona, kosaina, kakina, etc.) , turnip, raw milk	non-head type leafy vegetables and head type leafy vegetables, flowerhead breccias (spinach, cabbage, broccoli, cauliflower, Komatsuna (a green vegetable) ,kukidachina, nobuohuyona, aburana, chijirena, santona, kosaina, kakina, etc.)
Ibaraki	Spinach and Kakina (a green vegetable), parsley, raw milk	
Tochigi	Spinach and Kakina (a green vegetable)	
Gunma	Spinach and Kakina (a green vegetable)	

(2) Request for restriction on drinking of tap water (as of 18:00 March 26)

Scope of restriction	Water supply business entities (subjected local government)
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All residents who are users	Iidate Village Water Supply Entity (Iidate Village, Fukushima Prefecture)
Infants Water supply entities who continue responses	Koriyama City Water Supply Entity (Koriyama City, Fukushima) Minamisoma City (Minamisoma City, Fukushima) Kawamata Town Water Supply Entity (Kawamata Town, Fukushima) Iwaki City Waterworks Entity (Iwaki City, Fukushima) Tokai Village Waterworks Entity (Tokai Village, Ibaraki) Suifu District Northern Water Supply Entity (Hitachiota City, Ibaraki) Kitaibaraki City Water Supply Entity (Kitaibaraki City, Ibaraki) Kasama City Water Supply Entity (Kasama City, Ibaraki) Furikawa City Water Supply Entity (Furukawa City, Ibaraki) Toride City Water Supply Entity (Toride City, Ibaraki) North Chiba Wide Area Water Supply Entity

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

On March 21st, Directive titled as “Ventilation for using heating equipments within the in-house evacuation zone” from the Head of Local Emergency Response Headquarters to the Prefectural Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iidate Village) was issued, which directs those governor and heads to publicly announce the guidance to the residents within the in-house evacuation zone, concerning the indoor use of heating equipments that require ventilation, in order to avoid poisoning from carbon monoxide and to reduce exposure.

< Fire Bureaus’ Activities>

- From 11:00 till around 14:00 on March 22nd, Niigata City Fire Bureau and Hamamatsu City Fire Bureau gave guidance to TEPCO as to the set up of large decontamination system.
- From 8:30 till 9:30, from 13:30 till 14:30 on March 23rd, Niigata City Fire Bureau and Hamamatsu City Fire Bureau gave guidance to TEPCO as to the operation of large decontamination system.

(For inquiry on materials relating to this announcement)

NISA

Nuclear Safety Public Relations Division: Watanabe, Oyamada

Phone: 03-3501-1505

03-3501-5890

平成23年3月26日

原子力安全・保安院

地震被害情報（第55報）
（3月26日18時30分現在）

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

前回からの変更点は以下のとおり。

1. 原子力発電所関係

○福島第一原子力発電所

- ・2号機中央制御室の照明が復帰（26日16:46）

2. 産業保安関係

別紙参照

(別紙)

1 発電所の運転状況【自動停止号機数：10基】

○東京電力(株)福島第一原子力発電所（福島県双葉郡大熊町及び双葉町）

(1) 運転状況

1号機 (46 万 kW) (自動停止)

2号機 (78 万 4 千 kW) (自動停止)

3号機 (78 万 4 千 kW) (自動停止)

4号機 (78 万 4 千 kW) (定検により停止中)

5号機 (78 万 4 千 kW) (定検により停止中、20 日 14:30 冷温停止)

6号機 (110 万 kW) (定検により停止中、20 日 19:27 冷温停止)

(2) モニタリングの状況

別添参照

(3) 主なプラントパラメーター (26 日 14:00 現在)

	1号機	2号機	3号機	4号機	5号機	6号機
原子炉圧力* ¹ [MPa]	0.452(A) 0.481(B)	0.074(A) 0.074(B)	0.139(A) 0.000(C)	—	0.108	0.104
原子炉格納容器圧力 (D/W) [kPa]	275	110	106.8	—	—	—
原子炉水位* ² [mm]	-1650(A) -1600(B)	-1200(A) 不明 (B)	-1850(A) -2300(B)	—	2123	2094
原子炉格納容器内 S/C 水温 [°C]	—	—	—	—	—	—
原子炉格納容器内 S/C 圧力 [kPa]	275	D/S	183.6	—	—	—
使用済燃料プール 水温度 [°C]	—	57	—	指示不良	42.8	30.0
備 考	3/26 13:00 現在の値	3/26 13:00 現在の値	3/26 11:15 現在の値	3/24 11:00 現在の値	3/26 14:00 現在の値	3/26 14:00 現在の値

* 1 : 絶対圧に換算

* 2 : 燃料頂部からの数値

(4) 各プラントの状況

< 1号機関係 >

- ・ 原子力災害対策特別措置法第15条（非常用炉心冷却装置注水不能）通報（11日 16:36）
- ・ ベント操作（12日 10:17）
- ・ 1号機の原子炉圧力容器内に消火系ラインを用いて海水注入開始（12日 20:20）→14日 01:10 一時中断
- ・ 1号機で爆発音。（12日 15:36）
- ・ 消火系に加え、給水系を使うことにより炉心への注水量を増量（ $2\text{m}^3/\text{h}$ → $18\text{m}^3/\text{h}$ ）（23日 02:33）。その後、給水系のみに切替（約 $11\text{m}^3/\text{h}$ ）（23日 9:00）
- ・ 中央制御室の照明が復帰（24日 11:30）
- ・ 引き続き白煙の吐出確認（26日 8:00 現在）
- ・ タービン建屋地下の溜まり水を測定した結果、主な核種として ^{131}I （ヨウ素）が $2.1 \times 10^5 \text{Bq/cm}^3$ 、 ^{137}Cs （セシウム）が $1.8 \times 10^6 \text{Bq/cm}^3$ 、検出された。
- ・ 原子炉圧力容器へ淡水注入中。（26日 18:30 現在）

< 2号機関係 >

- ・ 原子力災害対策特別措置法第15条（非常用炉心冷却装置注水不能）通報（11日 16:36）
- ・ ベント操作（13日 11:00）
- ・ 3号機の建屋の爆発に伴い、原子炉建屋ブローアウトパネル開放（14日 11時過ぎ）
- ・ 原子炉圧力容器の水位が低下傾向（14日 13:18）。原子力災害対策特別措置法第15条事象（原子炉冷却機能喪失）である旨、受信（14日 13:49）
- ・ 原子炉圧力容器内に消火系ラインを用いて海水注入作業開始（14日 16:34）
- ・ 原子炉圧力容器の水位が低下傾向（14日 22:50）
- ・ ベント操作（15日 0:02）
- ・ 2号機で爆発音するとともに、サプレッションプール（圧力抑制室）の圧力低下（15日 6:10）。同室に異常が発生したおそれ（15日 6:20 頃）
- ・ 外部送電線から予備電源変電設備までの受電を完了し、そこから負荷側へのケーブル敷設を実施（19日 13:30 現在）
- ・ 使用済燃料プールに海水を 40 t 注入（冷却系配管に消防車のポンプを接続）（20日 15:05～17:20）
- ・ 2号機のパワーセンター受電（20日 15:46）

- ・ 白煙が発生（21 日 18:22）
- ・ 白煙はほとんど見えない程度に減少（22 日 7:11 現在）
- ・ 使用済燃料プールに海水を 18 t 注入（22 日 16:07～17:01）
- ・ 使用済燃料プールに、使用済燃料プール冷却系を用いて海水を注入（25 日 10:30～12:19）
- ・ 引き続き白煙の吐出確認（26 日 8:00 現在）
- ・ 中央制御室の照明が復帰（26 日 16:46）
- ・ 原子炉圧力容器へ淡水注入中（26 日 18:30 現在）

< 3 号機関係 >

- ・ 原子力災害対策特別措置法第 15 条（非常用炉心冷却装置注水不能）通報（13 日 05:10）
- ・ ベント操作（12 日 20:41）
- ・ ベント操作（13 日 9:20）
- ・ 3 号機の原子炉圧力容器内に消火系ラインから真水注入開始（13 日 11:55）
- ・ 3 号機の原子炉圧力容器内に消火系ラインから海水注入開始（13 日 13:12）
- ・ 3 号機及び 1 号機の注入をくみ上げ箇所海水が少なくなったため停止（14 日 1:10）
- ・ 3 号機の海水注入を再開（14 日 3:20）
- ・ ベント操作（14 日 5:20）
- ・ 3 号機の格納容器圧力が異常上昇（14 日 7:44）。原子力災害対策特別措置法第 15 条事象である旨、受信（14 日 7:52）
- ・ 3 号機で 1 号機と同様に原子炉建屋付近で爆発（14 日 11:01）
- ・ 3 号機から白い湯気のような煙が発生（16 日 8:30 頃）
- ・ 3 号機の格納容器が破損しているおそれがあるため、中央制御室（共用）から作業員退避（16 日 10:45）。その後、作業員は中央制御室に復帰し、注水作業再開（16 日 11:30）
- ・ 自衛隊ヘリにより 3 号機への海水の投下を 4 回実施（17 日 9:48、9:52、9:58、10:01）
- ・ 警察庁機動隊が放水のため現場到着（17 日 16:10）
- ・ 自衛隊消防車により放水（17 日 19:35）。
- ・ 警察庁機動隊による放水（17 日 19:05～19:13）
- ・ 自衛隊消防車 5 台が放水（17 日 19:35、19:45、19:53、20:00、20:07）
- ・ 自衛隊消防車 6 台（6 t 放水／台）が放水（18 日 14 時前～14:38）
- ・ 米軍消防車 1 台が放水（18 日 14:45 終了）
- ・ 東京消防庁ハイパーレスキュー隊が放水（20 日 3:40 終了）

- ・ 3号機の格納容器内圧力が上昇（20日 11:00 現在 320kPa）。圧力下げるための準備を進めていたが、直ちに放出を必要とする状況ではないと判断し、圧力監視を継続（21日 12:15 120 kPa）
- ・ ケーブル引き込みの現地調査（20日 11:00～16:00）
- ・ 東京消防庁ハイパーレスキュー隊が3号機の使用済燃料プールに放水（20日 21:30～21日 03:58）
- ・ 灰色がかった煙が発生（21日 15:55 頃）
- ・ 煙が収まっていることを確認（21日 17:55）
- ・ 灰色がかった煙は白みがかった煙に変化し終息に向かっていると思われる（22日 7:11 現在）
- ・ 東京消防庁及び大阪市消防局が放水（約 180t）（22日 15:10～16:00）
- ・ 中央制御室の照明が復帰（22日 22:43）
- ・ 使用済燃料プールに使用済燃料プール冷却系から海水 35t 注入（23日 11:03～13:20）
- ・ 原子炉建屋からやや黒色がかった煙が発生（23日 16:20 頃）。23日 23:30 頃及び 24日 4:50 頃に確認したところ止んでいる模様。
- ・ 使用済燃料プールに使用済燃料プール冷却系を用いて海水約 120 t を注入（24日 5:35 頃～16:05 頃）
- ・ 東京消防庁の支援を受けた川崎市消防局が放水（25日 13:28～16:00）
- ・ 引き続き白煙の吐出確認（26日 8:00 現在）
- ・ 原子炉圧力容器へ淡水注入中。（26日 18:30 現在）

< 4号機関係 >

- ・ 原子炉圧力容器のシュラウド工事中のため、原子炉圧力容器内に燃料はなし。
- ・ 使用済燃料プール水温度が上昇（3月 14日 4:08 時点 84℃）
- ・ 4号機のオペレーションエリアの壁が一部破損していることを確認（15日 6:14）。
- ・ 4号機で火災発生。（15日 9:38）事業者によると、自然に火が消えていることを確認（15日 11:00 頃）
- ・ 4号機で火災が発生（16日 5:45 頃）。事業者は現場での火災は確認できず（16日 6:15 頃）。
- ・ 自衛隊が使用済燃料プールへ放水（20日 9:43）
- ・ ケーブル引き込みの現地調査（20日 11:00～16:00）
- ・ 自衛隊が使用済燃料プールへ放水（20日 18:30 頃～19:46）
- ・ 自衛隊消防車 13 台が使用済燃料プールに放水（21日 06:37～08:41）
- ・ パワーセンターまでのケーブル敷設工事完了（21日 15:00 頃）

- ・パワーセンター受電（22日 10:35）
- ・コンクリートポンプ車（50 t／h）が約 150 t 放水（22日 17:17～20:32）
- ・コンクリートポンプ車（50 t／h）が約 130 t 放水（23日 10:00～13:02）
- ・コンクリートポンプ車（50 t／h）が約 150 t 放水（24日 14:36～17:30）。
- ・コンクリートポンプ車（50 t／h）が放水（25日 19:05～22:07）
- ・使用済燃料プールに、使用済燃料プール冷却系を用いて海水を注入（25日 06:05～10:20）
- ・引き続き白煙の吐出確認（26日 8:00 現在）

< 5号機、6号機関係 >

- ・6号機の非常用ディーゼル発電機（D/G）1台目（B）は運転により電力供給。復水補給水系（MUWC）を用いて原子炉圧力容器及び使用済燃料プールへ注水。
- ・6号機の非常用ディーゼル発電機（D/G）2台目（A）起動。（19日 4:22）
- ・5号機の残留熱除去系（RHR）ポンプ（C）（19日 5:00）及び6号機の残留熱除去系（RHR）ポンプ（B）（19日 22:14）が起動し、除熱機能回復。使用済燃料プールを優先的に冷却（電源：6号の非常用ディーゼル発電機）（19日 5:00）
- ・5号機、冷温停止（20日 14:30）
- ・6号機、冷温停止（20日 19:27）
- ・5号機及び6号機、起動用変圧器まで受電（20日 19:52）
- ・5号機、電源を非常用ディーゼル発電機から外部電源に切り替え（21日 11:36）
- ・6号機、電源を非常用ディーゼル発電機から外部電源に切り替え（22日 19:17）
- ・5号機の仮設の残留熱除去海水系（RHRS）ポンプが、仮設から本設の電源への切り替えの際、自動停止（23日 17:24）。
- ・5号機の仮設のRHRSポンプの修理が完了（24日 16:14）し、冷却を再開（24日 16:35）。
- ・6号機の仮設の残留熱除去海水系（RHRS）ポンプが、仮設から本設の電源へ切り替え（25日 15:38、15:42）

< 使用済燃料共用プール >

- ・18日 6：00過ぎ、プールはほぼ満水であることを確認
- ・共用プールに注水（21日 10:37～15:30）
- ・電源供給を開始（24日 15:37）し、冷却を開始（24日 18:05）。
- ・26日 8：30時点でのプール水温度は46℃程度

<その他>

- ・南放水口付近の海水核種分析の結果、 ^{131}I （ヨウ素）が $5.0 \times 10^1 \text{Bq/cm}^3$ 、（周辺監視区域外の水中濃度限度の 1250.8 倍）検出された。

○東京電力(株)福島第二原子力発電所（福島県双葉郡楢葉町及び富岡町）

（１）運転状況

- １号機（110 万 kW）（自動停止、14 日 17:00 冷温停止）
- ２号機（110 万 kW）（自動停止）14 日 18:00 冷温停止）
- ３号機（110 万 kW）（自動停止、12 日 12:15 冷温停止）
- ４号機（110 万 kW）（自動停止、15 日 7:15 冷温停止）

（２）モニタリングポスト等の指示値

別添参照

（３）主なプラントパラメーター（26 日 18:00 現在）

	単位	1 号機	2 号機	3 号機	4 号機
原子炉圧力* ¹	MPa	0.15	0.12	0.11	0.13
原子炉水温	℃	28.9	28.5	33.3	28.9
原子炉水位* ²	mm	9146	10246	8548	8785
原子炉格納容器内 サブレーションプール水温	℃	25	26	26	27
原子炉格納容器内 サブレーションプール圧力	kPa (abs)	107	106	103	105
備 考		冷温停止中	冷温停止中	冷温停止中	冷温停止中

* 1：絶対圧に換算

* 2：燃料頂部からの数値

（４）その他異常等に関する報告

- ・ 1 号機にて原子力災害対策特別措置法第 10 条通報（11 日 18:08）
- ・ 1、2、4 号機にて同法第 10 条通報（11 日 18:33）
- ・ 1 号機にて原子力災害対策特別措置法第 15 条事象（圧力抑制機能喪失）発生（12 日 5:22）
- ・ 2 号機にて原子力災害対策特別措置法第 15 条事象（圧力抑制機能喪失）発生（12 日 5:32）
- ・ 4 号機にて原子力災害対策特別措置法第 15 条事象（圧力抑制機能喪失）発生（12 日 6:07）

○東北電力(株)女川原子力発電所（宮城県牡鹿郡女川町、石巻市）

(1) 運転状況

1号機 (52万4千kW) (自動停止、12日 0:58 冷温停止)

2号機 (82万5千kW) (自動停止、地震時点で冷温停止)

3号機 (82万5千kW) (自動停止、12日 1:17 冷温停止)

(2) モニタリングポスト等の指示値

MP2 付近 (敷地最北敷地境界):

約 $0.98 \mu\text{Sv/h}$ (25日 16:00) → 約 $0.86 \mu\text{Sv/h}$ (26日 16:00)

(3) その他異常に関する報告

・タービン建屋地下1階の発煙は消火確認 (11日 22:55)

・原子力災害対策特別措置法第10条通報 (13日 13:09)

2 産業保安

○電気 (3月26日 19:30 現在)

・東北電力 (3月26日 18:00 現在)

停電戸数: 約 19万戸 (延べ停電戸数 約486万戸)

停電地域: 青森県 三八の一部地域 (約4百戸)

岩手県 一部地域 (約 3万5千戸)

宮城県 一部地域 (約 12万戸)

福島県 一部地域 (約3万8千戸)

・東京電力

停電は3月19日 01:00 までに復旧済 (延べ停電戸数 約405万戸)

・北海道電力

停電は3月12日 14:00 までに復旧済 (延べ停電戸数 約3千戸)

・中部電力

停電は3月12日 17:11 に復旧済 (延べ停電戸数 約4百戸)

[参考情報] 現在停止中の発電所 (原子力発電所を除く)

・東京電力 (26日 09:00 現在) ※地震により停止中の発電所

広野火力発電所 2, 4号機

常陸那珂火力発電所 1号機

鹿島火力発電所 2, 3, 5, 6号機

・東北電力 (26日 18:00 現在)

仙台火力発電所 4号機

新仙台火力発電所 1, 2号機

原町火力発電所 1, 2号機

○都市ガス（3月25日22:00現在）

- ・供給停止戸数※約43万戸（延べ供給停止戸数 約50万戸）

※供給停止戸数には、家屋倒壊等が確認された戸数を含む。

○一般ガス（3月25日22:00現在）

死亡事故：地震との関係も含め原因詳細調査中。

- ・盛岡ガス（盛岡市）死者1名、負傷者10名

14日08:00 デパートの地下での爆発

- ・東部ガス（いわき市）死者1名

12日11:30 一般住宅での漏えいガスに着火

北海道、山形県、秋田県においては、供給停止の報告はない。

各社の供給停止状況は以下の通り。（家屋倒壊等が確認された戸数は含まない。）

- ・仙台市営ガス 309,024戸供給停止
- ・塩釜ガス（塩釜市）9,515戸供給停止
- ・釜石ガス（釜石市）6,342戸供給停止
- ・常磐共同ガス（いわき市）11,055戸供給停止
- ・京葉ガス（浦安市）3,696戸供給停止
- ・東北ガス（白河市）35戸供給停止
- ・常磐都市ガス（いわき市）362戸供給停止
- ・気仙沼市営ガス（気仙沼市）1,400戸供給停止
- ・石巻ガス（石巻市）14,771戸供給停止

○簡易ガス（3月25日22:00現在）（家屋倒壊等が確認された戸数は含まない。）

各社の供給停止状況は以下の通り。

- ・宮城ガス（仙台市）2,058戸供給停止
（黒川郡富谷町）2,318戸供給停止
- ・岩沼市農業協同組合（岩沼市）753戸供給停止
- ・釜石瓦斯（釜石市）1,134戸供給停止
- ・仙台市ガス局（岩沼市）342戸供給停止
- ・仙台プロパン（亶理郡山元町）360戸供給停止
- ・仙南ガス（白石市）409戸供給停止
（岩沼市）252戸供給停止
（柴田郡柴田町）1,806戸供給停止
- ・カメイ（東松島市矢本町）243戸供給停止
- ・いわきガス（いわき市）594戸供給停止

- ・相馬ガス（相馬市）143 戸供給停止
- ・三重商会（大船渡市）81 戸供給停止
- ・八木又商店（大船渡市）105 戸供給停止
- ・名取岩沼農業協同組合（岩沼市）586 戸供給停止
- ・ガス＆ライフ（東松島市）498 戸供給停止
- ・仙台エルピーガス（仙台市）3,594 戸供給停止

○熱供給（3月24日22:00現在）

- ・小名浜配湯（いわき市小名浜）供給停止

○LPGガス（3月25日08:00現在）

死亡事故：地震との関係も含め原因詳細調査中

- ・福島県いわき市 死者1名
13日午前中 共同住宅でガス爆発

○コンビナート（3月25日08:00現在）

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

3 原子力安全・保安院等の対応

【3月11日】

- 14:46 地震発生と同時に原子力安全・保安院に災害対策本部設置
- 15:42 福島第一原子力発電所にて原子力災害対策特別措置法第10条通報
- 16:36 福島第一原子力発電所1、2号機にて事業者が同法第15条事象（非常用炉心冷却装置注水不能）発生判断（16:45 通報）
- 18:08 福島第二原子力発電所1号機にて原子力災害対策特別措置法第10条通報
- 18:33 福島第二原子力発電所1、2、4号機にて原子力災害対策特別措置法第10条通報
- 19:03 緊急事態宣言（政府原子力災害対策本部及び同現地対策本部設置）
- 20:50 福島県対策本部は、福島第一原子力発電所1号機の半径2kmの住人に避難指示を出した。（2km以内の住人は1,864人）
- 21:23 内閣総理大臣より、福島県知事、大熊町長及び双葉町長に対し、

東京電力(株)福島第一原子力発電所で発生した事故に関し、原子力災害対策特別措置法第15条第3項の規定に基づく指示を出した。

- ・福島第一原子力発電所から半径3km圏内の住民に対する避難指示。
- ・福島第一原子力発電所から半径10km圏内の住民に対する屋内退避指示。

24:00 池田経済産業副大臣現地対策本部到着

【3月12日】

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

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

5:44 総理指示により福島第一原子力発電所の10km圏内に避難指示

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

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

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

- ・福島第二原子力発電所から半径3km圏内の住民に対する避難指示。
- ・福島第二原子力発電所から半径10km圏内の住民に対する屋内退避指示。

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

17:39 内閣総理大臣が福島第二原子力発電所の避難区域

- ・福島第二原子力発電所から半径10km圏内の住民に対する避難を指示。

18:25 内閣総理大臣が福島第一原子力発電所の避難区域

- ・福島第一原子力発電所から半径20km圏内の住民に対する避難を指示。

19:55 福島第一原子力発電所1号機の海水注入について総理指示

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

20:20 福島第一原子力発電所1号機の海水注入を開始

【3月13日】

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

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

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

9:08 福島第一原子力発電所3号機の圧力抑制及び真水注入を開始

9:20 福島第一原子力発電所3号機の耐圧ベント弁開放

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

9:38 福島第一原子力発電所1号機にて原子力災害対策特別措置法第15条通報

13:09 女川原子力発電所にて原子力災害対策特別措置法第10条通報

13:12 福島第一原子力発電所3号機の注入を真水から海水に切り替え

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

【3月14日】

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

3:20 福島第一原子力発電所3号機の海水注入を再開

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

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

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

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

22:13 福島第二原子力発電所にて原子力災害対策特別措置法第10条通報

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

【3月15日】

0:00 国際原子力（IAEA）専門家派遣の受け入れを決定

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

- 0 : 0 0 米国原子力規制委員会（NRC）専門家派遣の受け入れを決定
- 7 : 2 1 福島第一原子力発電所にて原子力災害対策特別措置法第15条事
象（敷地境界放射線量異常上昇）である旨、受信
- 7 : 2 4 （独）日本原子力研究開発機構東海研究開発センター核燃料サイ
クル工学研究所にて原子力災害対策特別措置法第10条通報
- 7 : 4 4 （独）日本原子力研究開発機構原子力科学研究所にて原子力災害
対策特別措置法第10条通報
- 8 : 5 4 福島第一原子力発電所にて原子力災害対策特別措置法第15条事
象（敷地境界放射線量異常上昇）である旨、受信
- 10 : 3 0 経済産業大臣が原子炉等規制法に基づき、4号機の消火及び再臨
界の防止、2号機の原子炉内への早期注水及びドライウェルのベン
トの実施について指示
- 10 : 5 9 今後の事態の長期化を考慮し、現地対策本部の機能を福島県庁内
へ移転することを決定。
- 11 : 0 0 内閣総理大臣が福島第一原子力発電所の避難区域
・炉内の状況を考慮して、新たに福島第一原子力発電所から半径2
0km圏～30km圏内の住民に対する屋内退避を指示
- 16 : 3 0 福島第一原子力発電所にて原子力災害対策特別措置法第15条事
象（敷地境界放射線量異常上昇）である旨、受信
- 22 : 0 0 経済産業大臣が原子炉等規制法に基づき、4号機の使用済燃料プ
ールへの注水の実施を指示
- 23 : 4 6 福島第一原子力発電所にて原子力災害対策特別措置法第15条事
象（敷地境界放射線量異常上昇）である旨、受信

【3月18日】

- 13 : 0 0 文部科学省にて、福島第一、第二原子力発電所の緊急時における
全国的モニタリング調査の強化を決定
- 15 : 5 5 原子炉等規制法第62条の3に基づき、東京電力(株)福島第一原
子力発電所第1・2・3・4号機における事故故障等（原子炉建屋
内の放射性物質の非管理区域への漏えい）の報告を受理
- 16 : 4 8 原子炉等規制法第62条の3に基づき、日本原子力発電(株)東海
第二発電所における事故故障等（非常用ディーゼル発電機2C海水
ポンプ用電動機の故障）の報告を受理

【3月19日】

7 : 4 4 6号機の非常用ディーゼル発電機2台目(A)起動
5号機の残留熱除去系(RHR)ポンプ(C)が起動し、使用済燃料プールの冷却を開始(電源:6号機の非常用ディーゼル発電機))の旨を受信

8 : 5 8 福島第一原子力発電所にて原子力災害対策特別措置法第15条事象(敷地境界放射線量異常上昇)である旨、受信

【3月20日】

23 : 3 0 原子力災害対策現地本部から、放射能除染スクリーニングレベルの基準を以下のとおり変更する旨、県知事及び関係市町村長(富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、葛尾村、広野町、いわき市、飯館村)宛に指示

【3月21日】

7 : 4 5 原子力災害対策現地本部から「安定ヨウ素剤の服用について」として、安定ヨウ素剤の服用は、本部の指示を受け、医療関係者の立ち会いのもとで服用するものであり、個人の判断で服用しない旨の指示を、県知事及び関係市町村長(富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、葛尾村、広野町、いわき市、飯館村)宛に発出

16 : 4 5 原子力災害対策現地本部長から「屋内退避圏内での暖房器具の使用に係る換気について」として、一酸化炭素中毒等の防止の観点及び被ばく低減の観点から、屋内において換気を必要とする暖房器具を使用する場合の対応について屋内退避圏内の住民に周知する旨の指示を福島県知事及び市町村長(いわき市、田村市、南相馬市、広野町、川内村、浪江町、葛尾村、飯館村)宛に発出。

17 : 5 0 原子力災害対策本部長から、ハウレンソウ及びカキナ、原乳について当分の間、出荷を控えるよう、関係事業者等に要請することの指示を福島県、茨城県、栃木県及び群馬県の各知事宛に発出。

【3月22日】

16 : 0 0 原子力安全委員会緊急技術助言組織から、3月22日付け東京電力の「海水分析結果について」に関する原子力安全・保安院からの助言依頼について、回答(助言)を受理。

【3月25日】

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

<被ばくの可能性（3月26日18:30現在）>

1. 住民の被ばく

- (1) 二本松市福島県男女共生センターにおいて、双葉厚生病院からの避難者約60名を含む133名の測定を行い、13,000cpm以上の23名に除染を実施した。
- (2) この他、福島県が用意した民間バスで、双葉厚生病院から川俣町済生会川俣病院へ移動した35名については、県対策本部は被ばくしていないと判断。
- (3) バスにより避難した双葉町の住民約100名について、100名のうち、9名について測定した結果、以下の通りだった。県外(宮城県)に分かれて避難したが、その後合流して二本松市福島男女共生センターへ移動。

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

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

- (4) 3月12日から3月15日にかけて、大熊町のオフサイトセンターにおいて、スクリーニングを開始。現在までに162名が検査済み。初め除染の基準値を6,000cpmとし、110名が6,000cpm未満、41名が6,000cpm異常の値を示した。後に基準値を13,000cpmと引き上げた際には、8名が13,000cpm未満、3名が13,000cpm以上の値を示した。
検査を受けた162名のうち、5名が除染処置を施した後、病院へ搬送された。
- (5) 福島県において、避難した10km圏内の入院患者と病院関係者の避難を実施。関係者のスクリーニングを行った結果、3名について除染後も高い数値が検出されたため、第2次被ばく医療機関へ搬送。この搬送に関係した消防職員60名のスクリーニングで3名について、バックグラウンドの2倍以上程度の放射線が検出されたため、60名に対し除染を行った。
- (6) 福島県は3月13日からスクリーニングを開始。避難所を巡回、保健所等13ヶ所（常設）で実施中。3月24日までに87,813人に対し実施。そのうち、100,000cpm以上の値を示した者は98人であったが、100,000cpm以上の数値を示した者についても脱衣等をし、再計測したところ、100,000cpm以下に減少し、健康に影響を及ぼす事例はみられなか

った。

2. 従業員等の被ばく

福島第一原子力発電所で作業していた従業員で 100mSv を超過した作業員は、24 日福島第一原子力発電所 3 号機タービン建屋において、ケーブル敷設作業を行っていた作業員 3 名（全員協力社員）の線量が 170mSv 以上であることが確認され、計 18 名となっている。

なお、当該作業員 3 名のうち、2 名については、両足の皮膚に放射性物質の付着を確認し、ベータ線熱傷の可能性があるかと判断されたことから、24 日に福島県立医科大学附属病院へ搬送し、その後、25 日に作業員 3 名とも千葉県にある放射線医学総合研究所に到着。検査の結果、2 人の足の被ばく量は 2～6 Sv と推定されるが、足及び内部被ばく共に治療が必要となるレベルではなかったが、3 名とも、入院して経過を見ることとなった。

また、当該作業員が踏み入れた水について調査した結果、水表面の線量率は約 400mSv/h、採取水のガンマ線核種分析の結果、資料の濃度は各核種合計で約 $3.9 \times 10^6 \text{Bq/cm}^3$ であった。

3. その他

- (1) 福島第一原発で作業していた自衛隊員 4 名が爆発により負傷。うち、1 名は放医研に搬送され、検査の結果、外傷のみで、被ばくによる健康被害はないと判断され、3 月 17 日に退院。防衛省において、その他自衛官の被ばくは確認されず。
- (2) 警察官について、警察庁において 2 名の除染の実施を確認。異常の報告はなし。
- (3) 3 月 24 日、川俣町保健センター等において、1～15 歳までの 66 名の小児に対する甲状腺の検査を実施。問題となるレベルではなかった。

<放射能除染スクリーニングレベルに関する指示>

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

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

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

<避難時における安定ヨウ素剤投与の指示>

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

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

<負傷者の状況(3月26日18:30現在)>

1. 地震による被害

- ・社員2名(軽傷)
- ・協力会社2名(うち1名両足骨折)
- ・行方不明2名(社員。4号タービン建屋内)
- ・急病人1名発生(脳梗塞、救急車搬送、県情報)
- ・管理区域外にて社員1名が左胸の痛みを訴えて救急車を要請(意識あり)
- ・社員2名が中央制御室での全面マスク着用中に不調を訴え、福島第二の産業医の受診を受けるべく搬送

2. 福島第一原子力発電所1号機の爆発による負傷

- ・1号機付近で爆発と発煙が発生した際に4名が1号タービン建屋付近(管理区域外)で負傷。川内診療所で診療。

3. 福島第一原子力発電所3号機の爆発による負傷

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

4. その他の被害

- ・福島第二原子力発電所内の診療所に変電所から腹痛を訴える人が来たが、被ばくをしていないことからいわき市の診療所へ搬送。

<住民避難の状況(3月25日08:00現在)>

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

び関係自治体へ連絡。

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

- ・福島第一原子力発電所 20 km から 30 km 圏内の屋内退避について、徹底中。
- ・福島県と連携して、屋内退避圏内の住民の生活支援等を実施。

<飲食物への指示>

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

(1) 出荷制限・摂取制限品目 (3月23日現在)

都道府県	出荷制限品目	摂取制限品目
福島県	非結球性葉菜類、結球性葉菜類、アブラナ科の花畜類（ハウレンソウ、キャベツ、ブロッコリー、カリフラワー、小松菜、茎立菜、信夫冬菜、アブラナ、ちぢれ菜、山東菜、紅葉苔、カキナなど）、カブ、原乳	非結球性葉菜類、結球性葉菜類及びアブラナ科の花畜類（ハウレンソウ、キャベツ、ブロッコリー、カリフラワー、小松菜、茎立菜、信夫冬菜、アブラナ、アブラナ、ちぢれ菜、山東菜、紅葉苔、カキナなど）
茨城県	ハウレンソウ、カキナ、パセリ、原乳	
栃木県	ハウレンソウ、カキナ	
群馬県	ハウレンソウ、カキナ	

(2) 水道水の飲用制限の要請 (3月26日 18時現在)

制限範囲	水道事業 (対象自治体)
利用するすべての住民	飯舘村簡易水道事業 (福島県飯舘村)
乳児 ・対応を継続している水道事業	郡山市上水道事業 (福島県郡山市) 南相馬市水道事業 (福島県南相馬市) 川俣町水道事業 (福島県川俣町) いわき市上水道事業 (福島県いわき市) 東海村上水道事業 (茨城県東海村) 水府地区北部簡易水道事業 (茨城県常陸太田市) 北茨城市水道事業 (茨城県北茨城市) 笠間市水道事業 (茨城県笠間市)

<p>・対応を継続している水道用水供給事業</p>	<p>古河市水道事業（茨城県古河市） 取手市水道事業（茨城県取手市）</p> <p>北千葉広域水道用水供給事業</p>
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<屋内退避圏内での暖房器具の使用に係る換気についての指示>

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

<消防機関の活動状況>

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

（本発表資料のお問い合わせ）

原子力安全・保安院

原子力安全広報課：渡辺、小山田

電話：03-3501-1505

03-3501-5890

(参考)

【東北地方太平洋沖地震】

1. 災害概要

(1) 発生日時：平成 23 年 3 月 11 日（金） 14：46 発生

(2) 発生場所：震源三陸沖（北緯 38 度、東経 142.9 度）

深さ 10km、マグニチュード 9.0

(3) 各地の震度

○震度 4 以上の地域

震度 7 宮城県北部

震度 6 強 茨城県北部、茨城県南部

震度 5 強 青森県三八上北

震度 5 弱 新潟県中越

震度 4

○震度 4 以上の市町村

震度 6 強 福島県楢葉町、富岡町、大熊町、双葉町

震度 6 弱 宮城県石巻市、女川町（発電所の震度計による）、東海村

震度 5 弱 新潟県刈羽村

震度 4 青森県六ヶ所村、東通村、新潟県柏崎市、神奈川県横須賀市

震度 1 北海道泊村

From: Collins, Elmo
Sent: Saturday, March 26, 2011 5:57 PM
To: LIA03 Hoc
Cc: Virgilio, Martin
Subject: Re: 6:30 PM EST call Chairman and Chuck

Thanks

I'll call the ops center to join in at 5:30 CDT

Did I get the time correct?

Elmo

From: LIA03 Hoc
To: Liaison Japan
Sent: Sat Mar 26 16:37:13 2011
Subject: 6:30 PM EST call Chairman and Chuck

All,

We would like to confirm that Chuck will call into the Op Center for a daily call with the Chairman in approximately 2 hours (~7:30AM your time). Please let us know if this needs to change.

Thanks!

-Jenny

From: Shaffer, Mark R <ShafferMr@state.gov>
Sent: Sunday, March 27, 2011 1:16 AM
To: LIA03 Hoc
Cc: LIA02 Hoc; Schwartzman, Jennifer
Subject: Re: Access to PRIS system on IAEA website

I was at IAEA multiple times yesterday, but I do not plan to go today.

I'm not familiar with the PRIS system so I don't know if it has anything to do with emergency response.....if it doesn't, I respectfully request that the Commissioner wait until Monday, when IAEA staff are available to service his request for this non-emergency issue.

If it is emergency-related, you should send the request for access to the PRIS sytem directly to the IEC, who will get an answer for you within hours.

Mark

From: Schwartzman, Jennifer <Jennifer.Schwartzman@nrc.gov>
To: LIA03 Hoc <LIA03.Hoc@nrc.gov>; Shaffer, Mark R
Cc: LIA02 Hoc <LIA02.Hoc@nrc.gov>
Sent: Sat Mar 26 20:54:31 2011
Subject: RE: Access to PRIS system on IAEA website

Hi Jenny,

Unfortunately I do not have a login for PRIS but I bet someone in NRR does. Alternatively we can ask if Mark can help us get a new login ID and password from someone who may be working at the IAEA this weekend.

From: LIA03 Hoc
Sent: Saturday, March 26, 2011 8:38 PM
To: Schwartzman, Jennifer; 'ShafferMR@state.gov'
Cc: LIA02 Hoc
Subject: Access to PRIS system on IAEA website

Hey Mark and Jen,

One of the commissioners is trying to look at the PRIS webpage on the IAEA website but there's a login box for registered users. Could you enlighten me as to how he may gain access (I presume quickly rather than going through the registration process).

Thanks!
-Jenny

KKKK-102

From: Dorman, Dan
Sent: Saturday, March 26, 2011 6:19 PM
To: LIA03 Hoc; Liaison Japan
Subject: Re: 6:30 PM EST call Chairman and Chuck

Yes

From: LIA03 Hoc
To: Liaison Japan
Sent: Sat Mar 26 16:37:13 2011
Subject: 6:30 PM EST call Chairman and Chuck

All,

We would like to confirm that Chuck will call into the Op Center for a daily call with the Chairman in approximately 2 hours (~7:30AM your time). Please let us know if this needs to change.

Thanks!
-Jenny

From: Ramsey, Jack
Sent: Saturday, March 26, 2011 6:48 PM
To: LIA03 Hoc
Subject: Re: Chairman probably on flight to Tokyo in 3 hours (10:00PM EDT)

Please confirm this as soon as you can.

From: LIA03 Hoc
To: Liaison Japan
Sent: Sat Mar 26 18:41:57 2011
Subject: Chairman probably on flight to Tokyo in 3 hours (10:00PM EDT)

All,
If he can catch the flight, you'll see Chairman Jaczko tomorrow in Tokyo. Chuck, John and Dan are currently on the phone with him but thought you might want to know ASAP.

Thanks!
-Jenny

KKKK-104

From: Smith, Brooke
Sent: Saturday, March 26, 2011 6:47 PM
To: LIA03 Hoc
Subject: RE: Chairman probably on flight to Tokyo in 3 hours (10:00PM EDT)

What is his proposed schedule?

From: LIA03 Hoc
Sent: Saturday, March 26, 2011 6:41 PM
To: Liaison Japan
Subject: Chairman probably on flight to Tokyo in 3 hours (10:00PM EDT)

All,

If he can catch the flight, you'll see Chairman Jaczko tomorrow in Tokyo. Chuck, John and Dan are currently on the phone with him but thought you might want to know ASAP.

Thanks!
-Jenny

From: LIA06 Hoc
Sent: Sunday, March 27, 2011 5:07 PM
To: Hoc, PMT12
Cc: LIA08 Hoc
Subject: Map of military bases in Japan
Attachments: Military Bases in Japan--map.doc

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

KKKK-105

Military Bases in Japan



All US Military Bases in Japan



From: LIA10 Hoc
Sent: Sunday, March 27, 2011 5:12 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: METI-NISA News Release 57
Attachments: NISA_METI_News_Release_No57 (Japanese)1.pdf; METI News Release 57.docx

Attached is METI-NISA News Release 57, both the Japanese original and English translation.

News Release

Ministry of Economy, Trade and Industry
March 27, 2011
Nuclear and Industrial Safety Agency

Seismic Damage Information (the 57th Release)
(As of 15:30 March 27th, 2011)

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

Major updates are as follows.

1. Nuclear Power Station-related

Fukushima Dai-ichi Nuclear Power Station

Concrete pump truck (50t/h) is spraying water into Unit 3 (from 12:34 till 14:36 March 27)

As the result of sea water nuclide analysis on sea water near the south water drainage opening, 7.4×10^1 Bq/cm³ of ¹³¹I (iodine) (1850.5 times of the concentration limit in water outside perimeter monitoring zone) was detected. (14:30 March 26th)

2. Industry safety-related

See attached sheet

(Attached sheet)

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

Fukushima Dai-ichi NPS, TEPCO

(Okuma Town and FutabaTown, Futaba County, Fukushima Prefecture)

(1) The state of operation

Unit 1 (460MWe): automatic shutdown

Unit 2 (784MWe): automatic shutdown

Unit 3 (784MWe): automatic shutdown

Unit 4 (784MWe): in periodic inspection outage

Unit 5 (784MWe): in periodic inspection outage, cold shutdown at 14:30 March 20th

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

(2) Status of monitoring

See separate attachement

(3) Major Plant Parameters (As of 14:00 March 27th)

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Reactor pressure * ¹ [MPa]	0.475 (A) 0.517 (B)	0.083 (A) 0.081 (B)	0.133 (A) 0.002 (C)	--	0.108	0.106
Containment vessel pressure (D/W) [kPa]	270	110	107.6	--	--	--
Reactor water level * ² [mm]	-1650 (A) -1600 (B)	-1200 (A) Unknown (B)	-1900 (A) -2300 (B)	--	1930	2035
S/C water temperature inside containment vessel [°C]	--	--	--	--	--	--
S/C pressure inside containment vessel [kPa]	270	D/S (checking)	180.6	--	--	--
Spent fuel pool water temperature [°C]	--	67	--	Poor instruction	37.8	21.0

Comments	Value as of 3/27 9:00	Value as of 3/27 9:00	Value as of 3/27 10:10	Value as of 3/27 11:00	Value as of 3/27 14:00	Value as of 3/27 14:00
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*1: Converted from reading value to absolute pressure

*2: Distance from the top of fuel

(4) Situation of Each Unit

<Unit 1>

- TEPCO reported to NISA the event (Inability of water injection of the Emergency Core Cooling System) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (16:36 March 11th)
- Operation of Vent (10:17 March 12th)
- Seawater injection to the Reactor Pressure Vessel (RPV) via the Fire Extinguish Line started. (20:20 March 12th)→Temporary interruption of the injection (01:10 March 14th)
- The sound of explosion in Unit 1 occurred. (15:36 March 12th)
- The amount of injected water to the to the Reactor Core was increased by utilizing the Water Supply Line in addition to the Fire Extinguish Line. ($2\text{m}^3/\text{h} \rightarrow 18\text{m}^3/\text{h}$). (02:33 March 23rd) Later, it was switched to the Water Supply Line only (around $11\text{m}^3/\text{h}$). (09:00 March 23rd)
- Lighting in the Central Operation Room was recovered. (11:30 March 24th)
- White smoke was confirmed to generate continuously. (As of 08:00 March 26th)
- As the result of taking measurements on accumulated water in the basement of the turbine building, major nuclides, namely $2.1 \times 10^5 \text{Bq/cm}^3$ of ^{131}I (iodine) and $1.8 \times 10^6 \text{Bq/cm}^3$ of ^{137}Cs (cesium) were confirmed.
- Fresh water is being injected into RPV. (As of 15:30 March 27th)

<Unit 2>

- TEPCO reported to NISA the event (Inability of water injection of the Emergency Core Cooling System) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (16:36 March 11th)
- Operation of Vent (11:00 March 13th)
- The Blow-out Panel of reactor building was opened due to the explosion in the reactor building of Unit 3. (After 11:00 March 14th)
- Reactor Pressure Vessel water level tended to decrease. (13:18 March 14th). TEPCO reported to NISA the event (Loss of reactor cooling functions) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (13:49 March 14th)
- Seawater injection to RPV via the Fire Extinguish line continues. (As of 16:34 March 14th)
- Water level in RPV tended to decrease. (22:50 March 14th)
- Operation of Vent (0:02 March 15th)
- A sound of explosion was made in Unit 2. As the pressure in Suppression Chamber decreased (06:10 March 15th), there was a possibility that an incident occurred in the Chamber. (About 06:20 March 15th)

- Electric power receiving at the emergency power source transformer from the external transmission line was completed. The work for laying the electric cable from the facility to the load side was carried out. (As of 13:30 March 19th)
- 40 ton of seawater was injected into spent fuel pool. (Pumps of fire trucks were connected to cooling system pipes. (15:05 ~ 17:20 March 20th)
- Power Center of Unit 2 received electricity (15:46 March 20th)
- White smoke generated. (18:22 March 21st)
- White smoke was died down and almost invisible. (As of 07:11 March 22nd)
- Injection of 18t of Seawater to the Spent Fuel Pool was carried out. (From 16:07 till 17:01 March 22nd)
- Injection of seawater to the Spent Fuel Pool via the Fuel Pool Cooling Line was carried out. (From 10:30 till 12:19 March 25th)
- Seawater was injected into spent fuel pool using spent fuel pool cooling system. (10:30 – 12:19 March 25th)
- Continued generation of white smoke was confirmed. (As of 8:00 March 26th)
- Lighting in the Central Operation Room was recovered. (16:46 March 26th)
- Fresh water is being injected into RPV. (As of 15:30 March 27)

<Unit 3>

- TEPCO reported to NISA the event (Inability of water injection of the Emergency Core Cooling System) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (05:10 March 13th)
- Operation of Vent (20:41 March 12th)
- Operation of Vent (09:20 March 13th)
- Fresh water started to be injected to RPV via the Fire Extinguish Line. (11:55 March 13th)
- Seawater started to be injected to RPV via the Fire Extinguish Line. (13:12 March 13th)
- Seawater injection for Units 1 and 3 was interrupted due to the lack of seawater in pit. (01:10 March 14th)
- Seawater injection to RPV for Unit 3 was restarted. (03:20 March 14th)
- Operation of Vent (05:20 March 14th)
- The pressure in Primary Containment Vessel (PCV) of Unit 3 rose unusually. (07:44 March 14th) TEPCO reported to NISA on the event falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (7:52 March 14th)
- In Unit 3, the explosion like Unit 1 occurred around the reactor building (11:01 March 14th)
- The white smoke like steam generated from Unit 3. (08:30 March 16th)
- Because of the possibility that PCV of Unit 3 was damaged, the workers evacuated from the main control room of Units 3 and 4 (common control room). (10:45 March 16th) Thereafter the operators returned to the room and restarted the operation of water injection. (11:30 March 16th)
- Seawater was discharged 4 times to Unit 3 by the helicopters of the Self-Defense Force. (9:48, 9:52, 9:58 and 10:01 March 17th)
- The riot police arrived at the site for the water spray from the grand. (16:10 March 17th)

- The Self-Defense Force started the water spray using a fire engine. (19:35 March 17th)
- The water spray from the ground was carried out by the riot police. (From 19:05 till 19:13 March 17th)
- The water spray from the ground was carried out by the Self-Defense Force using 5 fire engines. (19:35, 19:45, 19:53, 20:00 and 20:07 March 17th)
- The water spray from the ground using 6 fire engines (6 tons of water spray per engine) was carried out by the Self-Defense Force. (From before 14:00 till 14:38 March 18th)
- The water spray from the ground using a fire engine provided by the US Military was carried out. (Finished at 14:45 March 18th)
- Hyper Rescue Unit of Tokyo Fire Department carried out the water spray. (Finished at 03:40 March 20th)
- The pressure in PCV of Unit 3 rose (320 kPa as of 11:00 March 20th). Preparation to lower the pressure was carried. Judging from the situation, immediate pressure relief was not required. Monitoring the pressure continues (120 kPa at 12:15 March 21st).
- On-site survey for leading electric cable (From 11:00 till 16:00 March 20th)
- Water spray over the Spent Fuel Pool of Unit 3 by Hyper Rescue Unit of Tokyo Fire Department was carried out (From 21:30 March 20th till 03:58 March 21st).
- Grayish smoke generated from Unit 3. (At around 15:55 March 21st)
- The smoke was confirmed to be died down. (17:55 March 21st)
- Grayish smoke changed to be whitish and seems to be ceasing. (As of 07:11 March 22nd)
- Water spray (Around 180t) by Hyper Rescue Unit of Tokyo Fire Department was carried out. (from 15:10 till 16:00 March 22nd)
- Lighting was recovered in the Central Operation Room. (22:43 March 22nd)
- Injection of 35t of seawater to the Spent Fuel Pool via the Fuel Pool Cooling Line was carried out. (From 11:03 till 13:20 March 23rd)
- Slightly blackish smoke generated from the reactor building. (Around 16:20 March 23rd) At around 23:30 March 23rd and around 4:50 March 24th, it was reported that the smoke seemed to cease.
- Around 120t of seawater was injected to the Spent Fuel Pool via the Fuel Pool Cooling Line. (From around 5:35 till around 16:05 March 24th)
- Kawasaki City Fire Department sprayed water with support from Tokyo Fire Department. (From 13:28 till 16:00 March 25th)
- Continuous generation of white smoke confirmed. (As of 8:00 March 26th)
- Concrete pump truck (50t/h) is spraying water (from 12:34 till 14:36 March 27th)
- Fresh water is being injected into RPV. (As of 15:30 March 27th)

<Unit 4>

- Because of the replacement work of the Shroud of RPV, no fuel was inside the RPV.
- The temperature of water in the Spent Fuel Pool had increased. (84°C at 04:08 March 14th)
- It was confirmed that a part of wall in the operation area of Unit 4 was damaged. (06:14 March 15th)

- The fire at Unit 4 occurred. (09:38 March 15th) TEPCO reported that the fire was extinguished spontaneously. (11:00 March 15th)
- The fire occurred at Unit 4. (5:45 March 16th) TEPCO reported that no fire could be confirmed on the ground. (At around 06:15 March 16th)
- The Self-Defense Force started water spray over the Spent Fuel Pool of Unit 4 (09:43 March 20th).
- On-site survey for leading electric cable (From 11:00 till 16:00 March 20th)
- Water spray over the Spent Fuel Pool of Unit 4 by Self-Defense Force was started. (From around 18:30 till 19:46 March 20th).
- Water spray over the Spent Fuel Pool by Self-Defense Force using 13 fire engines was started (From 06:37 till 08:41 March 21st).
- Works for laying electricity cable to the Power Center was completed. (At around 15:00 March 21st)
- Power Center received electricity. (10:35 March 22nd)
- Spray of around 150t of water using Concrete Pump Truck (50t/h) was carried out. (from 17:17 till 20:32 March 22nd)
- Spray of around 130t of water using Concrete Pump Truck (50t/h) was carried out. (From 10:00 till 13:02 March 23rd)
- Spray of around 150t of water using Concrete Pump Truck (50t/h) was carried out. (From 14:36 till 17:30 March 24th)
- Spray of around 150t of water using Concrete Pump Truck (50t/h). (From 19:05 till 22:07 March 25th)
- Injection of seawater to the Spent Fuel Pool via the Fuel Pool Cooling Line was carried out. (From 06:05 till 10:20 March 25th)
- White smoke was confirmed to generate continuously. (As of 8:00 March 26th)

<Units 5 and 6>

- The first unit of Emergency Diesel Generator (B) for Unit 6 is operating and supplying electricity. Water injection to RPV and the Spent Fuel Pool through the system of Make up Water Condensate (MUWC) is being carried out.
- The second unit of Emergency Diesel Generator (A) for Unit 6 started up. (04:22 March 19th)
- The pumps for Residual Heat Removal (RHR) (C) for Unit 5 (05:00 March 19th) and RHR (B) for Unit 6 (22:14 March 19th) started up and recovered heat removal function. It cools Spent Fuel Pool with priority. (Power supply : Emergency Diesel Generator for Unit 6) (05:00 March 19th)
- Unit 5 under cold shut down (14:30 March 20th)
- Unit 6 under cold shut down (19:27 March 20th)
- Receiving electricity reached to the transformer of starter. (19:52 March 20th)
- Power supply to Unit 5 was switched from the Emergency Diesel Generator to external power supply. (11:36 March 21st)
- Power supply to Unit 6 was switched from the Emergency Diesel Generator to external power supply. (19:17 March 22nd)

- The temporary pump for RHR Seawater System (RHRS) was automatically stopped when the power supply was switched from the temporary to the permanent. (17:24 March 23rd)
- Repair of the temporary pump for RHRS was completed (16:14 March 24th) and cooling was started again. (16:35 March 24th)
- Power source for temporary installed Residual Heat Removal System (RHRS) pumps of Unit 6 was switched from temporary installed one to permanently installed one. (15:38, 15:42 March 25th)

<Common Spent Fuel Pool>

- It was confirmed that the water level of Spent Fuel Pool was maintained full at after 06:00 March 18th.
- Water spray over the Common Spent Fuel Pool was carried out. (From 10:37 till 15:30 March 21st)
- The power was started to be supplied (15:37 March 24th) and cooling was also started. (18:05 March 24th)
- As of 8:00 March 27th, water temperature of the pool was around 39°C.

<Others>

- As the result of analysis on seawater nuclides near water spray nozzle in the south side, 7.4 X 10¹Bq/cm³ of ¹³¹I (iodine) (1850.5 times of the concentration limit in water outside perimeter monitoring zone) was detected. (14:30 March 26)

Fukushima Dai-ni NPS (TEPCO)

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

(1) The state of operation

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

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

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

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

(2) Indicated values at monitoring posts, etc See attached document

(3) Major plant parameters (As of 14:00 March 27th)

	Measurement unit	Unit 1	Unit 2	Unit 3	Unit 4
Reactor pressure *1	MPa	0.15	0.13	0.10	0.13
Reactor water temperature	°C	28.3	28.6	36.0	28.6
Reactor water level *2	mm	9296	10296	7880	8785
Suppression	°C	25	26	26	27

pool water temperature inside containment vessel					
Suppression pool pressure inside containment vessel	kPa (abs)	107	107	103	104
Comments		Cold shut down	Cold shut down	Cold shut down	Cold shut down

*1: Converted from reading value to absolute pressure

*2: Distance from the top of fuel

(4) Report concerning other incidents

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

Onagawa NPS (Tohoku Electric Power Co. Inc.)

(Onagawa Town, Oga County and Ishinomaki City, Miyagi Prefecture)

(1) The state of operation Unit 1 (524MWe): automatic shutdown, cold shut down at 0:58, March 12th

Unit 2 (825MWe): automatic shutdown, cold shut down at earthquake

Unit 3 (825MWe): automatic shutdown, cold shut down at 1:17, March 12th

(2) Readings of monitoring post, etc.

MP2 (Monitoring at the North End of Site Boundary)

approx. 0.98μSV/h (16:00 March 25th) → approx. 0.86μSV/h (16:00 March 26th)

(3) Report concerning other incidents

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

2. Industrial Safety

Electric power (as of March 27, 15:30)

Tohoku Electric Power Company (as of March 27, 13:00)

Number of households experiencing power outage: about 190,000 households (total cumulative number of household experienced power outage: about 4.86 million households)

Outage area: Aomori Prefecture 38 partial areas (about 4 million households)

Iwate Prefecture Partial area (about 35,000 households)

Miyagi Prefecture Partial area (about 120,000 households)

Fukushima Prefecture Partial area (about 38,000 households)

Tokyo Electric Power Company

Electric power has been already restored by 01:00 March 19. (total cumulative number: about 4.05 million households)

Hokkaido Electric Power Company

Electric power has been already restored by 14:00 March 12. (total cumulative number of households experienced power outage: about 3000 households)

Chubu Electric Power Company

Electric power has been already restored by 17:11 March 12. (total cumulative number of households experienced power outage: about 400 households)

[Reference information] Power Stations currently shut down (except Nuclear Power Stations)
Tokyo Electric Power Company (as of 09:00 March 27) * Power Stations currently shut down due to earthquakes

Hirono Thermal Power Station Units 2 and 4

Hitachinaka Thermal Power Station Unit 1

Kashima Thermal Power Station Units 2,3,5 and 6

Tohoku Electric Power Company (as of 13:00 March 27)

Sendai Thermal Power Station Unit 4

New Sendai Thermal Power Station Units 1 and 2

Haramachi Thermal Power Station Units 1 and 2

City gas (as of 15:30 March 27)

Number of households to which gas supply has been suspended *about 420,000 households (total cumulative number of households to which supply has been suspended: about 500,000 households)

* Number of households to which gas supply has been suspended includes households collapsed with confirmation.

General gas (as of 15:30 March 27)

Fatal accidents: Details of cause are under investigation including implication of earthquakes.

Morioka Gas (Morioka City) 1 death, 10 injured

08:00 March 14th Explosion in the basement of a department store

Tobu Gas (Iwaki City) 1 death

11:30 March 12 Leaked gas was ignited in general residential homes

In Hokkaido, Yamagata and Akita Prefectures, there is no report of suspension of supply.

Status of supply suspension for each company is as follows. (Number of households collapsed with confirmation not included)

Sendai City Gas Supply for 309,024 households suspended

Siogama Gas (Shiogama City) Supply for 9,515 households suspended

Kamaishi Gas (Kamaishi City) Supply for 6,342 households suspended

Tokiwa Kyodo Gas (Iwaki City) Supply for 11,055 households suspended

Kyoba Gas (Urayasu City) Supply for 3,696 households suspended

Tohoku Gas (Shirakawa City) Supply for 35 households suspended

Tokiwa Toshi Gas (Iwaki City) Supply for 362 households suspended

Kesennuma City Gas (Kesennuma City) Supply for 1,400 households suspended

Ishimaki Gas (Ishimaki City) Supply for 14,771 households suspended

Community gas (as of 15:30 March 27) (Number of households collapsed with confirmation not included)

Status of supply suspension of each company is as follows.

Miyagi Gas (Sendai City) Supply for 2,058 households suspended

(Tomitani Town, Kurokawa-gun) Supply for 2,318 households suspended

Iwanuma City Agricultural Cooperative (Iwanuma City) Supply for 753 households suspended

Kamaishi Gas (Kamaishi City) Supply for 1,134 households suspended

Sendai City Gas Department (Iwanuma City) Supply for 342 households suspended

Sendai Propane (Watari-gun, Yamamoto Town) Supply for 360 households suspended

Sennan Gas (Shiraishi City) Supply for 409 households suspended

(Iwanuma City) Supply for 252 households suspended

(Shibata-gun, Shibata Town) Supply for 1,806 households suspended

Kamei (Higashi Matsushima City Yamoto Town) Supply for 243 households suspended

Iwaki Gas (Iwaki City) Supply for 594 households suspended

Soma Gas (Soma City) Supply for 143 households suspended

Mie Shokai (Ofunato City) Supply for 81 households suspended

Yagimata Shoten (Ofunato City) Supply for 105 households suspended

Natori Iwanuma Agricultural Cooperative (Iwanuma City) Supply for 586 households suspended

Gas & Life (Higashi Matsushima City) Supply for 498 households suspended
Sendai LP Gas (Sendai City) Supply for 3,594 households suspended

Supply of heat (as of 15:30 March 27)

Konahama Hot Water Distribution (Iwaki City Konahama) Supply suspended

LP gas (as of 15:30 March 27)

Fatal accident: Details of cause including implication of earthquakes are under investigation

Fukushima Prefecture Iwaki City 1 death

Morning of March 13th Gas explosion in an apartment building

Industrial complex (as of 15:30 March 27)

Cosmo Petroleum Chiba Refinery (Chiba Prefecture Ichihara City)

Support columns of LPG storage tank were broken and damaged. Gas leaked and caused fire

1 serious injury, 5 minor injuries, Fire ceased in the morning of March 21

JX Nikko Nisseki Energy Co. Sendai Refinery (Miyagi Prefecture Sendai City)

There was explosion in shipping facility area and fire started. Fire ceased in the afternoon of March 15.

2. Action taken by NISA

(March 11th)

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

15:42 TEPCO reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

16:36 TEPCO recognized the event (Inability of water injection of the Emergency Core Cooling System) in accordance with the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Units 1 and 2 of Fukushima Dai-ichi NPS. (Reported to NISA at 16:45)

18:08 Regarding Unit 1 of Fukushima Dai-ichi NPS, TEPCO reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

18:33 Regarding Units 1, 2 and 4 of Fukushima Dai-ichi NPS, TEPCO reported to NISA in accordance with the Article 10 of Act on Special Measures Concerning Nuclear Emergency Preparedness.

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

20:50 Fukushima Prefecture's Emergency Response Headquarters issued a direction for the residents within 2 km radius from Unit 1 of Fukushima Dai-ichi NPS to evacuate. (The population of this area is 1,864.)

21:23 Directives from Prime Minister to the Governor of Fukushima Prefecture, the Mayor of Okuma Town and the Mayor of Futaba Town were issued regarding the event occurred at Fukushima Dai-ichi NPS, TEPCO, in accordance with the Paragraph 3, the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness as follows:

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

24:00 Vice Minister of Economy, Trade and Industry, Ikeda arrived at the Local Emergency Response Headquarters (March 12th)

05:22 Regarding Unit 1 of Fukushima Dai-ichi NPS, TEPCO recognized the event (Loss of pressure suppression function) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (Reported to NISA at 06:27)

05:32 Regarding Unit 2 of Fukushima Dai-ichi NPS, TEPCO recognized the event (Loss of pressure suppression function) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

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

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

06:50 In accordance with the Paragraph 3, the Article 64 of the Nuclear Regulation Act, the order was issued to control the internal pressure of PCV of Units 1 and 2 of Fukushima Dai-ichi NPS.

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

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

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

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

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

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

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

20:20 At Unit 1 of Fukushima Dai-ichi NPS, seawater injection started. (March 13th)

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

09:01 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

09:08 Pressure suppression and fresh water injection started for Unit 3 of Fukushima Dai-ichi NPS.

09:20 The Pressure Vent Valve of Unit 3 of Fukushima Dai-ichi NPS was opened.

09:30 Directive was issued for the Governor of Fukushima Prefecture, the Mayors of Okuma Town, Futaba Town, Tomioka Town and Namie Town in accordance with the Act on Special Measures Concerning Nuclear Emergency Preparedness on the contents of radioactivity decontamination screening.

09:38 TEPCO reported to NISA that Unit 1 of Fukushima Dai-ichi NPS reached a situation specified in the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

13:09 Tohoku Electric Power Co. reported to NISA that Onagawa NPS reached a situation specified in the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

13:12 Fresh water injection was switched to seawater injection for Unit 3 of Fukushima Dai-ichi NPS.

14:36 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS. (March 14th)

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

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

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

05:38 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

07:52 TEPCO reported to NISA the event (Unusual rise of the pressure in PCV) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 3 of Fukushima Dai-ichi NPS.

13:25 Regarding Unit 2 of Fukushima Dai-ichi NPS, TEPCO recognized the event (Loss of reactor cooling function) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

22:13 TEPCO reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

22:35 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

(March 15th)

00:00: The acceptance of experts from IAEA was decided. NISA agreed to accept the offer of dispatching of the expert on NPS damage from IAEA considering the intention by Mr. Amano, Director General of IAEA. Therefore, the schedule of expert acceptance will be planned from now on according to the situation.

00:00: NISA also decided the acceptance of experts dispatched from NRC.

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

07:24 Incorporated Administration Agency, Japan Atomic Energy Agency (JAEA) reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Nuclear Fuel Cycle Engineering Laboratories, Tokai Research and Development Centre.

07:44 JAEA reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Nuclear Science Research Institute.

08:54 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

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

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

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

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

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 in-reactor situation.

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

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

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

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

(March 18th)

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

15:55 TEPCO reported to NISA on the accidents and failure at Units 1, 2, 3 and 4 of Fukushima Dai-ichi NPS (Leakage of the radioactive materials inside of the reactor buildings to non-controlled area of radiation) pursuant to the Article 62-3 of the Nuclear Regulation Act.

16:48 Japan Atomic Power Co. reported to NISA accidents and failures in Tokai NPS (Failure of the seawater pump motor of the emergency diesel generator 2C) pursuant to the Article 62-3 of the Nuclear Regulation Act.

(March 19th)

07:44 The second unit of Emergency Diesel Generator (A) for Unit 6 started up. TEPCO reported to NISA that the pump for RHR (C) for Unit 5 started up and started to cooling Spent Fuel Storage Pool. (Power supply: Emergency Diesel Generator for Unit 6)

08:58 TEPCO reported to NISA the event (Unusual increase of radiation dose at the site boundary) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

(March 20th)

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

(March 21st)

07:45 Directive titled as “Administration of the stable Iodine” was issued from Local Emergency Response Headquarters to the Prefectural Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iitate Village), which directs the above-mentioned governor and the heads to administer stable Iodine under the direction of the headquarters and in the presence of medical experts, and not to administer it on personal judgments.

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 (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iitate Village), which directs the above-mentioned governor and heads to publicly announce the guidance to the residents within the in-house evacuation zone, concerning the indoor use of heating equipments that require ventilation, in order to avoid poisoning from carbon monoxide and to reduce exposure.

17:50 Directive from the Head of Government Nuclear Emergency Response Headquarters to the Prefectural Governors of Fukushima, Ibaraki, Tochigi and Gunma was issued, which direct the above-mentioned governors to issue a request to relevant businesses and people to suspend shipment of spinach, Kakina (a green vegetable) and raw milk for the time being.

(March 22nd)

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

(March 25th)

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

< Possibility on radiation exposure (As of 15:30 March 27th) >

1. Exposure of residents

(1) Including the about 60 evacuees from Futaba Public Welfare Hospital to Nihonmatsu City Fukushima Gender Equality Centre, as the result of measurement of 133 persons at the Centre, 23 persons counted more than 13,000 cpm were decontaminated.

(2) The 35 residents transferred from Futaba Public Welfare Hospital to Kawamata Town Saiseikai Kawamata Hospital by private bus arranged by Fukushima Prefecture were judged to be not contaminated by the Prefectural Response Centre.

(3) As for the about 100 residents in Futaba Town evacuated by bus, the results of measurement for 9 of the 100 residents were as follows. The evacuees, moving outside the Prefecture (Miyagi Prefecture), were divided into two groups, which joined later to Nihonmatsu City Fukushima Gender Equality Centre.

Radiation count	Number of people
18,000 cpm	1
30,000 ~ 36,000 cpm	1
40,000 cpm	1
Slightly less than 40,000 cpm *	1
Very low	5

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

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

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

(5) The Fukushima Prefecture carried out the evacuation of patients and personnel of the hospitals located within 10km area. The screening of all the members showed that 3 persons have the high counting rate. These members were transported to the secondary medical institute of exposure. As a result of the screening on 60 fire fighting personnel involved in the

transportation activities, the radioactivity higher than twice of the back ground was detected on 3 members. Therefore, all the 60 members were decontaminated.

(6) Fukushima prefecture started screening on March 13. Screeners visited evacuation shelters and currently implementing screening at 13 sites (permanent sites) including healthcare centers. 91,768 people have been screened by March 25. There were 98 people among them on whom 100,000 cpm or higher value was detected. As those who showed 100,000 cpm or higher value were unclothed and measured again, and their reading decreased to 100,000 cpm or less. There were no cases that showed negative health impact.

2. Exposure of workers

As for the workers conducting operations in Fukushima Dai-ichi NPS, the number of people who were at the level of exposure more than 100mSv increased as three workers (All the people were the subcontractor's employees.) who were laying cables in the turbine building of Unit 3 of the NPS were confirmed to be at the level of exposure more than 170mSv. In total, the number of workers who were at the level of exposure more than 100mSv becomes 19.

For two of the three workers who were laying cables, the attachment of radioactive material on the skin of both legs was confirmed. As the two workers were judged to have a possibility of beta ray burn, they were transferred to the Fukushima Medical University Hospital on March 24th, and departed for the National Institute of Radiological Sciences in the Chiba Prefecture on March 25th. As the result of examination, their exposure dose on their feet is considered to be 2 to 6 Sv and no treatment was necessary for both internal exposure and foot exposure.

However, it was decided to place all three under observation in the hospital. All three are scheduled to be discharged from the hospital by the afternoon of March 28th.

Concerning the result of survey for the water that those workers stepped in, the dose rate on the surface of the water was about 400mSv/h and, as a result of gamma ray nuclide analysis of sampled water, the concentration of radioactive nuclide of the sample was about 3.9×10^6 Bq/cm³ in total of each nuclides.

3. Others

(1) 4 members of Self-Defense Force who worked in Fukushima Dai-ichi NPS were injured by explosion. One member was transferred to National Institute of Radiological Sciences. After the examination, judged that there were wounds but no risk for health from the exposure, the one was released from the hospital on March 17th. No other exposure of the Self-Defense Force member was confirmed at the Ministry of Defense.

(2) As for policeman, the decontaminations of two policemen were confirmed by the National Police Agency. Nothing unusual was reported.

(3) On March 24th, examinations of thyroid gland for 66 children aged from 1 to 15 years old were carried out. The result was at the level of exposure of no problem.

<Directive of screening levels for decontamination of radioactivity>

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

Old : 40 Bq/cm² measured by a gamma-ray survey meter or 6,000 cpm

New : 1 μ Sv/hour (dose rate at 10cm distance) or 100,000cpm equivalent

<Directives of administering stable Iodine during evacuation>

(1) On March 16th, the Local Emergency Response Headquarters issued "Directive to administer the stable Iodine during evacuation from the evacuation area (20 km radius)" to the Prefectural Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iidate Village).

(2) On March 21st, the Local Emergency Response Headquarters issued Directive titled as "Administration of the stable Iodine" to the Prefectural Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iidate Village), which directs the above-mentioned governor and heads to administer stable Iodine under the direction of the headquarters and in the presence of medical experts, and not to administer it on personal judgments.

<Situation of the injured (As of 08:00 March 27th)>

1. Injury due to earthquake

- Two employees (slightly)
- Two subcontract employees (one fracture in both legs)
- Two missing (TEPCO's employee, missing in the turbine building of Unit 4)
- One emergency patient (According to the local prefecture, one patient of cerebral infarction was transported by the ambulance).
- Ambulance was requested for one employee complaining the pain at left chest outside of control area (conscious).
- Two employees complaining discomfort wearing full-face mask in the main control room were transported to Fukushima Dai-ni NPS for a consultation with an industrial doctor.

2. Injury due to the explosion of Unit 1 of Fukushima Dai-ichi NPS

- 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.

3. Injury due to the explosion of Unit 3 of Fukushima Dai-ichi NPS

- Four TEPCO's employees
- Three subcontractor employees

- Four members of Self-Defence Force (one of them was transported to National Institute of Radiological Sciences considering internal possible exposure. The examination resulted in no internal exposure. The member was discharged from the institute on March 17th.)

4. Other injuries

- A person who visited the clinic in Fukushima Dai-ni NPS from a transformer sub-station, claiming of a stomach ache, was transported to a clinic in Iwaki City, because the person was not contaminated.

<Situation of resident evacuation (As of 15:30 March 27th)>

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

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

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

<Directive regarding foods and drinks>

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

(1) Products shipment and intake thereof are restricted (as of March 23)

Prefecture	Products shipment thereof is restricted	Products intake thereof is restricted
Fukushima	non-head type leafy vegetables and head type leafy vegetables, flowerhead breccias (spinach, cabbage, broccoli, cauliflower, Komatsuna (a green vegetable) ,kukidachina, nobuohuyona, aburana, chijirena, santona, kosaina, kakina, etc.) , turnip, raw milk	non-head type leafy vegetables and head type leafy vegetables, flowerhead breccias (spinach, cabbage, broccoli, cauliflower, Komatsuna (a green vegetable) ,kukidachina, nobuohuyona, aburana, chijirena, santona, kosaina, kakina, etc.)
Ibaraki	Spinach and Kakina (a green vegetable), parsley, raw milk	
Tochigi	Spinach and Kakina (a green vegetable)	

Gunma	Spinach and Kakina (a green vegetable)	
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(2) Request for restriction on drinking of tap water (as of 15:30 March 27)

Scope of restriction	Water supply business entities (subjected local government)
All residents who are users	Iidate Village Water Supply Entity (Iidate Village, Fukushima Prefecture)
Infants Water supply entities who continue responses	Koriyama City Water Supply Entity (Koriyama City, Fukushima) Minamisoma City (Minamisoma City, Fukushima) Kawamata Town Water Supply Entity (Kawamata Town, Fukushima) Iwaki City Waterworks Entity (Iwaki City, Fukushima) Tokai Village Waterworks Entity (Tokai Village, Ibaraki) Suifu District Northern Water Supply Entity (Hitachiota City, Ibaraki) Kitaibaraki City Water Supply Entity (Kitaibaraki City, Ibaraki) Kasama City Water Supply Entity (Kasama City, Ibaraki) Furukawa City Water Supply Entity (Furukawa City, Ibaraki) Toride City Water Supply Entity (Toride City, Ibaraki) North Chiba Wide Area Water Supply Entity

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

On March 21st, Directive titled as “Ventilation for using heating equipments within the in-house evacuation zone” from the Head of Local Emergency Response Headquarters to the Prefectural Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iidate Village) was issued, which directs those governor and heads to publicly announce the guidance to the residents within the in-house evacuation zone, concerning the indoor use of heating equipments that require ventilation, in order to avoid poisoning from carbon monoxide and to reduce exposure.

< Fire Bureaus’ Activities>

- From 11:00 till around 14:00 on March 22nd, Niigata City Fire Bureau and Hamamatsu City Fire Bureau gave guidance to TEPCO as to the set up of large decontamination system.
- From 8:30 till 9:30, from 13:30 till 14:30 on March 23rd, Niigata City Fire Bureau and Hamamatsu City Fire Bureau gave guidance to TEPCO as to the operation of large decontamination system.

(For inquiry on materials relating to this announcement)
NISA

Nuclear Safety Public Relations Division: Watanabe, Oyamada
Phone: 03-3501-1505
03-3501-5890

(For reference)

Earthquake off the Pacific coast of the Tohoku region

1. Outline of the disaster

(1) Date: 11 March 2011 (Friday) 14:46

(2) Place: Epicenter was off the Sanriku coast (38deg N, 142.9deg E), Depth 10km, M9.0.

(3) Earthquake intensity by region, on the Japanese scale.

- Regions at 4 and above
 - 7 Northern Miyagi prefecture
 - 6+ Northern Ibaragi prefecture, southern Ibaragi prefecture
 - 5+ Southern Aomori prefecture (a.k.a. Sanpachi Kitakami region)
 - 5- Chuetsu region of Niigata prefecture
- Municipalities at 4 and above
 - 6+ Naraha town, Tomioka town, Okuma town, Futaba town; Fukushima Prefecture
 - 6- Ishinomaki city, Onagawa town (power plant seismograph reading), Tokai village; Miyagi prefecture
 - 5- Kariwa village, Niigata prefecture
 - 4 Rokkasho village, Higashidori village; Aomori prefecture. Kashiwazaki city, Niigata prefecture. Yokosuka city, Kanagawa prefecture.
 - 1 Tomari village, Hokkaido

平成23年3月27日

原子力安全・保安院

地震被害情報（第57報） （3月27日15時30分現在）

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

前回からの変更点は以下のとおり。

1. 原子力発電所関係

○福島第一原子力発電所

- ・ 3号機について、コンクリートポンプ車（50 t／h）が放水
（27日12:34～14:36）
- ・ 南放水口付近の海水核種分析の結果、 ^{131}I （ヨウ素）が $7.4 \times 10^1 \text{Bq/cm}^3$
（周辺監視区域外の水中濃度限度の 1850.5 倍）検出された。（26日14:30）

2. 産業保安関係

別紙参照

(別紙)

1 発電所の運転状況【自動停止号機数：10基】

○東京電力(株)福島第一原子力発電所（福島県双葉郡大熊町及び双葉町）

(1) 運転状況

1号機 (46 万 kW) (自動停止)

2号機 (78 万 4 千 kW) (自動停止)

3号機 (78 万 4 千 kW) (自動停止)

4号機 (78 万 4 千 kW) (定検により停止中)

5号機 (78 万 4 千 kW) (定検により停止中、20 日 14:30 冷温停止)

6号機 (110 万 kW) (定検により停止中、20 日 19:27 冷温停止)

(2) モニタリングの状況

別添参照

(3) 主なプラントパラメーター (27 日 14:00 現在)

	1号機	2号機	3号機	4号機	5号機	6号機
原子炉圧力* ¹ [MPa]	0.475(A) 0.517(B)	0.083(A) 0.081(B)	0.133(A) 0.002(C)	—	0.108	0.106
原子炉格納容器圧力 (D/W) [kPa]	270	110	107.6	—	—	—
原子炉水位* ² [mm]	-1650(A) -1600(B)	-1200(A) 不明 (B)	-1900(A) -2300(B)	—	1930	2035
原子炉格納容器内 S/C 水温 [°C]	—	—	—	—	—	—
原子炉格納容器内 S/C 圧力 [kPa]	270	D/S (調査中)	180.6	—	—	—
使用済燃料プール 水温度 [°C]	—	67	—	指示不良	37.8	21.0
備 考	3/27 9:00 現在の値	3/27 9:00 現在の値	3/27 10:10 現在の値	3/24 11:00 現在の値	3/27 14:00 現在の値	3/27 14:00 現在の値

* 1 : 絶対圧に換算

* 2 : 燃料頂部からの数値

(4) 各プラントの状況

< 1号機関係 >

- ・原子力災害対策特別措置法第15条（非常用炉心冷却装置注水不能）通報（11日16:36）
- ・ベント操作（12日10:17）
- ・1号機の原子炉圧力容器内に消火系ラインを用いて海水注入開始（12日20:20）→14日01:10一時中断
- ・1号機で爆発音。（12日15:36）
- ・消火系に加え、給水系を使うことにより炉心への注水量を増量（ $2\text{m}^3/\text{h}$ → $18\text{m}^3/\text{h}$ ）（23日02:33）。その後、給水系のみに切替（約 $11\text{m}^3/\text{h}$ ）（23日9:00）
- ・中央制御室の照明が復帰（24日11:30）
- ・引き続き白煙の吐出確認（26日8:00現在）
- ・タービン建屋地下の溜まり水を測定した結果、主な核種として ^{131}I （ヨウ素）が $2.1 \times 10^5 \text{Bq}/\text{cm}^3$ 、 ^{137}Cs （セシウム）が $1.8 \times 10^6 \text{Bq}/\text{cm}^3$ 、検出された。
- ・原子炉圧力容器へ淡水注入中。（27日15:30現在）

< 2号機関係 >

- ・原子力災害対策特別措置法第15条（非常用炉心冷却装置注水不能）通報（11日16:36）
- ・ベント操作（13日11:00）
- ・3号機の建屋の爆発に伴い、原子炉建屋ブローアウトパネル開放（14日11時過ぎ）
- ・原子炉圧力容器の水位が低下傾向（14日13:18）。原子力災害対策特別措置法第15条事象（原子炉冷却機能喪失）である旨、受信（14日13:49）
- ・原子炉圧力容器内に消火系ラインを用いて海水注入作業開始（14日16:34）
- ・原子炉圧力容器の水位が低下傾向（14日22:50）
- ・ベント操作（15日0:02）
- ・2号機で爆発音するとともに、サブプレッションプール（圧力抑制室）の圧力低下（15日6:10）。同室に異常が発生したおそれ（15日6:20頃）
- ・外部送電線から予備電源変電設備までの受電を完了し、そこから負荷側へのケーブル敷設を実施（19日13:30現在）
- ・使用済燃料プールに海水を40t注入（冷却系配管に消防車のポンプを接続）（20日15:05～17:20）
- ・2号機のパワーセンター受電（20日15:46）

- ・白煙が発生（21 日 18:22）
- ・白煙はほとんど見えない程度に減少（22 日 7:11 現在）
- ・使用済燃料プールに海水を 18 t 注入（22 日 16:07～17:01）
- ・使用済燃料プールに、使用済燃料プール冷却系を用いて海水を注入（25 日 10:30～12:19）
- ・引き続き白煙の吐出確認（26 日 8:00 現在）
- ・中央制御室の照明が復帰（26 日 16:46）
- ・原子炉圧力容器へ淡水注入中（27 日 15:30 現在）

< 3 号機関係 >

- ・原子力災害対策特別措置法第 15 条（非常用炉心冷却装置注水不能）通報（13 日 05:10）
- ・ベント操作（12 日 20:41）
- ・ベント操作（13 日 8:41）
- ・3 号機の原子炉圧力容器内に消火系ラインから真水注入開始（13 日 11:55）
- ・3 号機の原子炉圧力容器内に消火系ラインから海水注入開始（13 日 13:12）
- ・3 号機及び 1 号機の注入をくみ上げ箇所の海水が少なくなったため停止（14 日 1:10）
- ・3 号機の海水注入を再開（14 日 3:20）
- ・ベント操作（14 日 5:20）
- ・3 号機の格納容器圧力が異常上昇（14 日 7:44）。原子力災害対策特別措置法第 15 条事象である旨、受信（14 日 7:52）
- ・3 号機で 1 号機と同様に原子炉建屋付近で爆発（14 日 11:01）
- ・3 号機から白い湯気のような煙が発生（16 日 8:30 頃）
- ・3 号機の格納容器が破損しているおそれがあるため、中央制御室（共用）から作業員退避（16 日 10:45）。その後、作業員は中央制御室に復帰し、注水作業再開（16 日 11:30）
- ・自衛隊ヘリにより 3 号機への海水の投下を 4 回実施（17 日 9:48、9:52、9:58、10:01）
- ・警察庁機動隊が放水のため現場到着（17 日 16:10）
- ・自衛隊消防車により放水（17 日 19:35）。
- ・警察庁機動隊による放水（17 日 19:05～19:13）
- ・自衛隊消防車 5 台が放水（17 日 19:35、19:45、19:53、20:00、20:07）
- ・自衛隊消防車 6 台（6 t 放水／台）が放水（18 日 14 時前～14:38）
- ・米軍消防車 1 台が放水（18 日 14:45 終了）
- ・東京消防庁ハイパーレスキュー隊が放水（20 日 3:40 終了）

- ・ 3号機の格納容器内圧力が上昇（20日 11:00 現在 320kPa）。圧力下げるための準備を進めていたが、直ちに放出を必要とする状況ではないと判断し、圧力監視を継続（21日 12:15 120 kPa）
- ・ ケーブル引き込みの現地調査（20日 11:00～16:00）
- ・ 東京消防庁ハイパーレスキュー隊が3号機の使用済燃料プールに放水（20日 21:30～21日 03:58）
- ・ 灰色がかった煙が発生（21日 15:55 頃）
- ・ 煙が収まっていることを確認（21日 17:55）
- ・ 灰色がかった煙は白みがかった煙に変化し終息に向かっていると思われる（22日 7:11 現在）
- ・ 東京消防庁及び大阪市消防局が放水（約 180t）（22日 15:10～16:00）
- ・ 中央制御室の照明が復帰（22日 22:43）
- ・ 使用済燃料プールに使用済燃料プール冷却系から海水 35t 注入（23日 11:03～13:20）
- ・ 原子炉建屋からやや黒色がかった煙が発生（23日 16:20 頃）。23日 23:30 頃及び 24日 4:50 頃に確認したところ止んでいる模様。
- ・ 使用済燃料プールに使用済燃料プール冷却系を用いて海水約 120 t を注入（24日 5:35 頃～16:05 頃）
- ・ 東京消防庁の支援を受けた川崎市消防局が放水（25日 13:28～16:00）
- ・ 引き続き白煙の吐出確認（26日 8:00 現在）
- ・ コンクリートポンプ車（50 t／h）が放水（27日 12:34～14:36）
- ・ 原子炉圧力容器へ淡水注入中。（27日 15:30 現在）

< 4号機関係 >

- ・ 原子炉圧力容器のシュラウド工事中のため、原子炉圧力容器内に燃料はなし。
- ・ 使用済燃料プール水温度が上昇（3月 14日 4:08 時点 84℃）
- ・ 4号機のオペレーションエリアの壁が一部破損していることを確認（15日 6:14）。
- ・ 4号機で火災発生。（15日 9:38）事業者によると、自然に火が消えていることを確認（15日 11:00 頃）
- ・ 4号機で火災が発生（16日 5:45 頃）。事業者は現場での火災は確認できず（16日 6:15 頃）。
- ・ 自衛隊が使用済燃料プールへ放水（20日 9:43）
- ・ ケーブル引き込みの現地調査（20日 11:00～16:00）
- ・ 自衛隊が使用済燃料プールへ放水（20日 18:30 頃～19:46）
- ・ 自衛隊消防車 13 台が使用済燃料プールに放水（21日 06:37～08:41）

- ・パワーセンターまでのケーブル敷設工事完了（21日 15:00 頃）
- ・パワーセンター受電（22日 10:35）
- ・コンクリートポンプ車（50 t / h）が約 150 t 放水（22日 17:17～20:32）
- ・コンクリートポンプ車（50 t / h）が約 130 t 放水（23日 10:00～13:02）
- ・コンクリートポンプ車（50 t / h）が約 150 t 放水（24日 14:36～17:30）。
- ・コンクリートポンプ車（50 t / h）が約 150 t 放水（25日 19:05～22:07）
- ・使用済燃料プールに、使用済燃料プール冷却系を用いて海水を注入（25日 06:05～10:20）
- ・引き続き白煙の吐出確認（26日 08:00 現在）

< 5号機, 6号機関係 >

- ・ 6号機の非常用ディーゼル発電機（D/G）1台目（B）は運転により電力供給。復水補給水系（MUWC）を用いて原子炉圧力容器及び使用済燃料プールへ注水。
- ・ 6号機の非常用ディーゼル発電機（D/G）2台目（A）起動。（19日 4:22）
- ・ 5号機の残留熱除去系（RHR）ポンプ（C）（19日 5:00）及び6号機の残留熱除去系（RHR）ポンプ（B）（19日 22:14）が起動し、除熱機能回復。使用済燃料プールを優先的に冷却（電源：6号の非常用ディーゼル発電機）（19日 5:00）
- ・ 5号機、冷温停止（20日 14:30）
- ・ 6号機、冷温停止（20日 19:27）
- ・ 5号機及び6号機、起動用変圧器まで受電（20日 19:52）
- ・ 5号機、電源を非常用ディーゼル発電機から外部電源に切り替え（21日 11:36）
- ・ 6号機、電源を非常用ディーゼル発電機から外部電源に切り替え（22日 19:17）
- ・ 5号機の仮設の残留熱除去海水系（RHRS）ポンプが、仮設から本設の電源への切り替えの際、自動停止（23日 17:24）。
- ・ 5号機の仮設のRHRSポンプの修理が完了（24日 16:14）し、冷却を再開（24日 16:35）。
- ・ 6号機の仮設の残留熱除去海水系（RHRS）ポンプが、仮設から本設の電源へ切り替え（25日 15:38、15:42）

< 使用済燃料共用プール >

- ・ 18日 6 : 00 過ぎ、プールはほぼ満水であることを確認
- ・ 共用プールに注水（21日 10:37～15:30）
- ・ 電源供給を開始（24日 15:37）し、冷却を開始（24日 18:05）。

- ・ 27日8:00時点でのプール水温度は39℃程度

<その他>

- ・ 南放水口付近の海水核種分析の結果、 ^{131}I （ヨウ素）が $7.4 \times 10^1 \text{Bq/cm}^3$ 、
（周辺監視区域外の水中濃度限度の 1850.5 倍）検出された。（26日14:30）

○東京電力(株)福島第二原子力発電所（福島県双葉郡楢葉町及び富岡町）

（1）運転状況

- 1号機（110万kW）（自動停止、14日17:00 冷温停止）
- 2号機（110万kW）（自動停止）14日18:00 冷温停止）
- 3号機（110万kW）（自動停止、12日12:15 冷温停止）
- 4号機（110万kW）（自動停止、15日7:15 冷温停止）

（2）モニタリングポスト等の指示値

別添参照

（3）主なプラントパラメーター（27日14:00 現在）

	単位	1号機	2号機	3号機	4号機
原子炉圧力* ¹	MPa	0.15	0.13	0.10	0.13
原子炉水温	℃	28.3	28.6	36.0	28.6
原子炉水位* ²	mm	9296	10296	7880	8785
原子炉格納容器内 サプレッションプール水温	℃	25	26	26	27
原子炉格納容器内 サプレッションプール圧力	kPa (abs)	107	107	103	104
備 考		冷温停止中	冷温停止中	冷温停止中	冷温停止中

* 1：絶対圧に換算

* 2：燃料頂部からの数値

（4）その他異常等に関する報告

- ・ 1号機にて原子力災害対策特別措置法第10条通報（11日18:08）
- ・ 1、2、4号機にて同法第10条通報（11日18:33）
- ・ 1号機にて原子力災害対策特別措置法第15条事象（圧力抑制機能喪失）
発生（12日5:22）
- ・ 2号機にて原子力災害対策特別措置法第15条事象（圧力抑制機能喪失）
発生（12日5:32）
- ・ 4号機にて原子力災害対策特別措置法第15条事象（圧力抑制機能喪失）
発生（12日6:07）

○東北電力(株)女川原子力発電所（宮城県牡鹿郡女川町、石巻市）

（１）運転状況

１号機（52万4千kW）（自動停止、12日0:58冷温停止）

２号機（82万5千kW）（自動停止、地震時点で冷温停止）

３号機（82万5千kW）（自動停止、12日1:17冷温停止）

（２）モニタリングポスト等の指示値

MP2付近（敷地最北敷地境界）：

約0.98 μ Sv/h（25日16:00）→約0.86 μ Sv/h（26日16:00）

（３）その他異常に関する報告

- ・タービン建屋地下1階の発煙は消火確認（11日22:55）
- ・原子力災害対策特別措置法第10条通報（13日13:09）

2 産業保安

○電気（3月27日15:30現在）

・東北電力（3月27日13:00現在）

停電戸数：約19万戸（延べ停電戸数 約486万戸）

停電地域：青森県 三八の一部地域（約4百戸）

岩手県 一部地域（約3万5千戸）

宮城県 一部地域（約12万戸）

福島県 一部地域（約3万8千戸）

・東京電力

停電は3月19日01:00までに復旧済（延べ停電戸数 約405万戸）

・北海道電力

停電は3月12日14:00までに復旧済（延べ停電戸数 約3千戸）

・中部電力

停電は3月12日17:11に復旧済（延べ停電戸数 約4百戸）

[参考情報] 現在停止中の発電所（原子力発電所を除く）

・東京電力（27日09:00現在）※地震により停止中の発電所

広野火力発電所 2, 4号機

常陸那珂火力発電所 1号機

鹿島火力発電所 2, 3, 5, 6号機

・東北電力（27日13:00現在）

仙台火力発電所 4号機

新仙台火力発電所 1, 2号機

原町火力発電所 1, 2号機

○都市ガス（3月27日15:30現在）

- ・供給停止戸数*約42万戸（延べ供給停止戸数 約50万戸）

*供給停止戸数には、家屋倒壊等が確認された戸数を含む。

○一般ガス（3月27日15:30現在）

死亡事故：地震との関係も含め原因詳細調査中。

- ・盛岡ガス（盛岡市）死者1名、負傷者10名

14日08:00 デパートの地下での爆発

- ・東部ガス（いわき市）死者1名

12日11:30 一般住宅での漏えいガスに着火

北海道、山形県、秋田県においては、供給停止の報告はない。

各社の供給停止状況は以下の通り。（家屋倒壊等が確認された戸数は含まない。）

- ・仙台市営ガス 305,770戸供給停止
- ・塩釜ガス（塩釜市）9,515戸供給停止
- ・釜石ガス（釜石市）6,342戸供給停止
- ・常磐共同ガス（いわき市）11,055戸供給停止
- ・京葉ガス（浦安市）1,977戸供給停止
- ・東北ガス（白河市）18戸供給停止
- ・常磐都市ガス（いわき市）362戸供給停止
- ・気仙沼市営ガス（気仙沼市）1,400戸供給停止
- ・石巻ガス（石巻市）14,771戸供給停止

○簡易ガス（3月27日15:30現在）（家屋倒壊等が確認された戸数は含まない。）

各社の供給停止状況は以下の通り。

- ・宮城ガス（仙台市）2,058戸供給停止
（黒川郡富谷町）2,318戸供給停止
- ・岩沼市農業協同組合（岩沼市）753戸供給停止
- ・釜石瓦斯（釜石市）1,134戸供給停止
- ・仙台市ガス局（岩沼市）342戸供給停止
- ・仙台プロパン（亶理郡山元町）360戸供給停止
- ・仙南ガス（白石市）409戸供給停止
（岩沼市）252戸供給停止
（柴田郡柴田町）1,806戸供給停止
- ・カメイ（東松島市矢本町）243戸供給停止
- ・いわきガス（いわき市）594戸供給停止

- ・相馬ガス（相馬市）143 戸供給停止
- ・三重商会（大船渡市）81 戸供給停止
- ・八木又商店（大船渡市）105 戸供給停止
- ・名取岩沼農業協同組合（岩沼市）586 戸供給停止
（名取市）105 戸供給停止
- ・ガス&ライフ（東松島市）498 戸供給停止
- ・仙台エルピーガス（仙台市）3,594 戸供給停止

○熱供給（3 月 27 日 15:30 現在）

- ・小名浜配湯（いわき市小名浜）供給停止

○LPGガス（3 月 27 日 15:30 現在）

死亡事故：地震との関係も含め原因詳細調査中

- ・福島県いわき市 死者 1 名
13 日午前中 共同住宅でガス爆発

○コンビナート（3 月 27 日 15:30 現在）

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

3 原子力安全・保安院等の対応

【3 月 11 日】

- 14:46 地震発生と同時に原子力安全・保安院に災害対策本部設置
- 15:42 福島第一原子力発電所にて原子力災害対策特別措置法第 10 条通報
- 16:36 福島第一原子力発電所 1、2 号機にて事業者が同法第 15 条事象（非常用炉心冷却装置注水不能）発生判断（16:45 通報）
- 18:08 福島第二原子力発電所 1 号機にて原子力災害対策特別措置法第 10 条通報
- 18:33 福島第二原子力発電所 1、2、4 号機にて原子力災害対策特別措置法第 10 条通報
- 19:03 緊急事態宣言（政府原子力災害対策本部及び同現地対策本部設置）
- 20:50 福島県対策本部は、福島第一原子力発電所 1 号機の半径 2 km の住人に避難指示を出した。（2 km 以内の住人は 1,864 人）

- 21:23 内閣総理大臣より、福島県知事、大熊町長及び双葉町長に対し、東京電力(株)福島第一原子力発電所で発生した事故に関し、原子力災害対策特別措置法第15条第3項の規定に基づく指示を出した。
- ・福島第一原子力発電所から半径3km圏内の住民に対する避難指示。
 - ・福島第一原子力発電所から半径10km圏内の住民に対する屋内退避指示。

24:00 池田経済産業副大臣現地対策本部到着

【3月12日】

- 5:22 福島第二原子力発電所1号機にて事業者が原子力災害対策特別措置法第15条事象（圧力抑制機能喪失）発生判断（6:27 通報）
- 5:32 福島第二原子力発電所2号機にて事業者が原子力災害対策特別措置法第15条事象（圧力抑制機能喪失）発生判断（6:27 通報）
- 5:44 総理指示により福島第一原子力発電所の10km圏内に避難指示
- 6:07 福島第二原子力発電所4号機にて原子力災害対策特別措置法第15条事象（圧力抑制機能喪失）発生
- 6:50 原子炉等規制法第64条第3項の規定に基づき、福島第一原子力発電所第1号機及び第2号機に設置された原子炉格納容器内の圧力を抑制することを命じた。
- 7:45 内閣総理大臣より、福島県知事、広野町長、楢葉町長、富岡町長及び大熊町長に対し、東京電力(株)福島第二原子力発電所で発生した事故に関し、原子力災害対策特別措置法第15条第3項の規定に基づく指示を出した。
- ・福島第二原子力発電所から半径3km圏内の住民に対する避難指示。
 - ・福島第二原子力発電所から半径10km圏内の住民に対する屋内退避指示。
- 17:00 福島第一原子力発電所にて原子力災害対策特別措置法第15条事象（敷地境界放射線量異常上昇）である旨、受信
- 17:39 内閣総理大臣が福島第二原子力発電所の避難区域
- ・福島第二原子力発電所から半径10km圏内の住民に対する避難を指示。
- 18:25 内閣総理大臣が福島第一原子力発電所の避難区域
- ・福島第一原子力発電所から半径20km圏内の住民に対する避難を指示。
- 19:55 福島第一原子力発電所1号機の海水注入について総理指示
- 20:05 総理指示を踏まえ、原子炉等規制法第64条第3項の規定に基づ

き、福島第一原子力発電所第1号機の海水注入等を命じた。

20:20 福島第一原子力発電所1号機の海水注入を開始

【3月13日】

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

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

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

9:08 福島第一原子力発電所3号機の圧力抑制及び真水注入を開始

9:20 福島第一原子力発電所3号機の耐圧ベント弁開放

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

9:38 福島第一原子力発電所1号機にて原子力災害対策特別措置法第15条通報

13:09 女川原子力発電所にて原子力災害対策特別措置法第10条通報

13:12 福島第一原子力発電所3号機の注入を真水から海水に切り替え

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

【3月14日】

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

3:20 福島第一原子力発電所3号機の海水注入を再開

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

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

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

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

22:13 福島第二原子力発電所にて原子力災害対策特別措置法第10条通報

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

【3月15日】

- 0 : 0 0 国際原子力（I A E A）専門家派遣の受け入れを決定
I A E A天野事務局長による原子力発電所の被害に関する専門
家派遣の意向を受け、原子力安全・保安院はI A E Aによる知見あ
る専門家の派遣を受け入れることとした。なお、実際の受け入れ日
程等については、今後調整を行う。
- 0 : 0 0 米国原子力規制委員会（N R C）専門家派遣の受け入れを決定
- 7 : 2 1 福島第一原子力発電所にて原子力災害対策特別措置法第15条事
象（敷地境界放射線量異常上昇）である旨、受信
- 7 : 2 4 （独）日本原子力研究開発機構東海研究開発センター核燃料サイ
クル工学研究所にて原子力災害対策特別措置法第10条通報
- 7 : 4 4 （独）日本原子力研究開発機構原子力科学研究所にて原子力災害
対策特別措置法第10条通報
- 8 : 5 4 福島第一原子力発電所にて原子力災害対策特別措置法第15条事
象（敷地境界放射線量異常上昇）である旨、受信
- 1 0 : 3 0 経済産業大臣が原子炉等規制法に基づき、4号機の消火及び再臨
界の防止、2号機の原子炉内への早期注水及びドライウエルのベン
トの実施について指示
- 1 0 : 5 9 今後の事態の長期化を考慮し、現地対策本部の機能を福島県庁内
へ移転することを決定。
- 1 1 : 0 0 内閣総理大臣が福島第一原子力発電所の避難区域
・炉内の状況を考慮して、新たに福島第一原子力発電所から半径2
0 k m圏～3 0 k m圏内の住民に対する屋内退避を指示
- 1 6 : 3 0 福島第一原子力発電所にて原子力災害対策特別措置法第15条事
象（敷地境界放射線量異常上昇）である旨、受信
- 2 2 : 0 0 経済産業大臣が原子炉等規制法に基づき、4号機の使用済燃料プ
ールへの注水の実施を指示
- 2 3 : 4 6 福島第一原子力発電所にて原子力災害対策特別措置法第15条事
象（敷地境界放射線量異常上昇）である旨、受信

【3月18日】

- 1 3 : 0 0 文部科学省にて、福島第一、第二原子力発電所の緊急時における
全国的モニタリング調査の強化を決定
- 1 5 : 5 5 原子炉等規制法第62条の3に基づき、東京電力(株)福島第一原
子力発電所第1・2・3・4号機における事故故障等（原子炉建屋
内の放射性物質の非管理区域への漏えい）の報告を受理
- 1 6 : 4 8 原子炉等規制法第62条の3に基づき、日本原子力発電(株)東海
第二発電所における事故故障等（非常用ディーゼル発電機2C海水

ポンプ用電動機の故障)の報告を受理

【3月19日】

- 7:44 6号機の非常用ディーゼル発電機2台目(A)起動
5号機の残留熱除去系(RHR)ポンプ(C)が起動し、使用済燃料プールの冷却を開始(電源:6号機の非常用ディーゼル発電機))の旨を受信
- 8:58 福島第一原子力発電所にて原子力災害対策特別措置法第15条事象(敷地境界放射線量異常上昇)である旨、受信

【3月20日】

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

【3月21日】

- 7:45 原子力災害対策現地本部から「安定ヨウ素剤の服用について」として、安定ヨウ素剤の服用は、本部の指示を受け、医療関係者の立ち会いのもとで服用するものであり、個人の判断で服用しない旨の指示を、県知事及び関係市町村長(富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、葛尾村、広野町、いわき市、飯舘村)宛に発出
- 16:45 原子力災害対策現地本部長から「屋内退避圏内での暖房器具の使用に係る換気について」として、一酸化炭素中毒等の防止の観点及び被ばく低減の観点から、屋内において換気を必要とする暖房器具を使用する場合の対応について屋内退避圏内の住民に周知する旨の指示を福島県知事及び市町村長(いわき市、田村市、南相馬市、広野町、川内村、浪江町、葛尾村、飯舘村)宛に発出。
- 17:50 原子力災害対策本部長から、ハウレンソウ及びカキナ、原乳について当分の間、出荷を控えるよう、関係事業者等に要請することの指示を福島県、茨城県、栃木県及び群馬県の各知事宛に発出。

【3月22日】

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

【3月25日】

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

し、改善するよう、口頭で指示。

<被ばくの可能性（3月27日 15:30 現在）>

1. 住民の被ばく

- (1) 二本松市福島県男女共生センターにおいて、双葉厚生病院からの避難者約60名を含む133名の測定を行い、13,000cpm以上の23名に除染を実施した。
- (2) この他、福島県が用意した民間バスで、双葉厚生病院から川俣町済生会川俣病院へ移動した35名については、県対策本部は被ばくしていないと判断。
- (3) バスにより避難した双葉町の住民約100名について、100名のうち、9名について測定した結果、以下の通りだった。県外(宮城県)に分かれて避難したが、その後合流して二本松市福島男女共生センターへ移動。

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

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

- (4) 3月12日から3月15日にかけて、大熊町のオフサイトセンターにおいて、スクリーニングを開始。現在までに162名が検査済み。初め除染の基準値を6,000cpmとし、110名が6,000cpm未満、41名が6,000cpm異常の値を示した。後に基準値を13,000cpmと引き上げた際には、8名が13,000cpm未満、3名が13,000cpm以上の値を示した。
検査を受けた162名のうち、5名が除染処置を施した後、病院へ搬送された。
- (5) 福島県において、避難した10km圏内の入院患者と病院関係者の避難を実施。関係者のスクリーニングを行った結果、3名について除染後も高い数値が検出されたため、第2次被ばく医療機関へ搬送。この搬送に関係した消防職員60名のスクリーニングで3名について、バックグラウンドの2倍以上程度の放射線が検出されたため、60名に対し除染を行った。
- (6) 福島県は3月13日からスクリーニングを開始。避難所を巡回、保健所等13ヶ所（常設）で実施中。3月25日までに91,768人に対し実施。そのうち、100,000cpm以上の値を示した者は98人であったが、100,000cpm以上の数値を示した者についても脱衣等をし、再計測したと

ころ、100,000cpm 以下に減少し、健康に影響を及ぼす事例はみられなかった。

2. 従業員等の被ばく

福島第一原子力発電所で作業していた従業員で 100mSv を超過した作業員は、24 日福島第一原子力発電所 3 号機タービン建屋において、ケーブル敷設作業を行っていた作業員 3 名（全員協力社員）の線量が 170mSv 以上であることが確認され、計 19 名となっている。

なお、当該作業員 3 名のうち、2 名については、両足の皮膚に放射性物質の付着を確認し、ベータ線熱傷の可能性があるとは判断されたことから、24 日に福島県立医科大学附属病院へ搬送し、その後、25 日に作業員 3 名とも千葉県にある放射線医学総合研究所に到着。検査の結果、2 人の足の被ばく量は 2～6 Sv と推定され、足及び内部被ばく共に治療が必要となるレベルではなかったが、3 名とも、入院して経過を見ることとなった。28 日午後には 3 名の方すべて退院する予定。

また、当該作業員が踏み入れた水について調査した結果、水表面の線量率は約 400mSv/h、採取水のガンマ線核種分析の結果、資料の濃度は各核種合計で約 $3.9 \times 10^6 \text{Bq/cm}^3$ であった。

3. その他

- (1) 福島第一原発で作業していた自衛隊員 4 名が爆発により負傷。うち、1 名は放医研に搬送され、検査の結果、外傷のみで、被ばくによる健康被害はないと判断され、3 月 17 日に退院。防衛省において、その他自衛官の被ばくは確認されず。
- (2) 警察官について、警察庁において 2 名の除染の実施を確認。異常の報告はなし。
- (3) 3 月 24 日、川俣町保健センター等において、1～15 歳までの 66 名の小児に対する甲状腺の検査を実施。問題となるレベルではなかった。

<放射能除染スクリーニングレベルに関する指示>

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

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

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

＜避難時における安定ヨウ素剤投与の指示＞

- (1) 3月16日、原子力災害対策現地本部から、「避難区域（半径20km）からの避難時における安定ヨウ素剤投与の指示」を県知事及び市町村（富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、葛尾村、広野町、いわき市、飯館村）宛に発出。
- (2) 3月21日、原子力災害対策現地本部から「安定ヨウ素剤の服用について」として、安定ヨウ素剤の服用は、本部の指示を受け、医療関係者の立ち会いのもとで服用するものであり、個人の判断で服用しない旨の指示を、県知事及び関係市町村長（富岡町、双葉町、大熊町、浪江町、川内村、楢葉町、南相馬市、田村市、葛尾村、広野町、いわき市、飯館村）宛に発出。

＜負傷者の状況（3月27日08:00現在）＞

1. 地震による被害
 - ・社員2名（軽傷）
 - ・協力会社2名（うち1名両足骨折）
 - ・行方不明2名（社員。4号タービン建屋内）
 - ・急病人1名発生（脳梗塞、救急車搬送、県情報）
 - ・管理区域外にて社員1名が左胸の痛みを訴えて救急車を要請（意識あり）
 - ・社員2名が中央制御室での全面マスク着用中に不調を訴え、福島第二の産業医の受診を受けるべく搬送
2. 福島第一原子力発電所1号機の爆発による負傷
 - ・1号機付近で爆発と発煙が発生した際に4名が1号タービン建屋付近（管理区域外）で負傷。川内診療所で診療。
3. 福島第一原子力発電所3号機の爆発による負傷
 - ・社員4名
 - ・協力会社3名
 - ・自衛隊4名（うち1名は内部被ばくの可能性を考慮し、「(独)放射線医学総合研究所」へ搬送。診察の結果内部被ばくはなし。3月17日退院）
4. その他の被害
 - ・福島第二原子力発電所内の診療所に変電所から腹痛を訴える人が来たが、被ばくをしていないことからいわき市の診療所へ搬送。

<住民避難の状況（3月27日 15:30 現在）>

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

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

- ・福島第一原子力発電所20 kmから30 km圏内の屋内退避について、徹底中。
- ・福島県と連携して、屋内退避圏内の住民の生活支援等を実施。

<飲食物への指示>

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

（1）出荷制限・摂取制限品目（3月23日現在）

都道府県	出荷制限品目	摂取制限品目
福島県	非結球性葉菜類、結球性葉菜類、アブラナ科の花畜類（ハウレンソウ、キャベツ、ブロッコリー、カリフラワー、小松菜、茎立菜、信夫冬菜、アブラナ、ちぢれ菜、山東菜、紅菜苔、カキナなど）、カブ、原乳	非結球性葉菜類、結球性葉菜類及びアブラナ科の花畜類（ハウレンソウ、キャベツ、ブロッコリー、カリフラワー、小松菜、茎立菜、信夫冬菜、アブラナ、アブラナ、ちぢれ菜、山東菜、紅菜苔、カキナなど）
茨城県	ハウレンソウ、カキナ、パセリ、原乳	
栃木県	ハウレンソウ、カキナ	
群馬県	ハウレンソウ、カキナ	

（2）水道水の飲用制限の要請（3月27日 15:30 現在）

制限範囲	水道事業（対象自治体）
利用するすべての住民	飯舘村簡易水道事業（福島県飯舘村）
乳児 ・対応を継続している水道事業	郡山市上水道事業（福島県郡山市） 南相馬市水道事業（福島県南相馬市） 川俣町水道事業（福島県川俣町） いわき市上水道事業（福島県いわき市） 田村市水道事業（福島県田村市）

<p>・対応を継続している水道用水供給事業</p>	<p>東海村上水道事業（茨城県東海村） 水府地区北部簡易水道事業（茨城県常陸太田市） 北茨城市水道事業（茨城県北茨城市） 笠間市水道事業（茨城県笠間市） 古河市水道事業（茨城県古河市） 取手市水道事業（茨城県取手市） 北千葉広域水道用水供給事業</p>
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<屋内退避圏内での暖房器具の使用に係る換気についての指示>

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

<消防機関の活動状況>

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

（本発表資料のお問い合わせ）

原子力安全・保安院

原子力安全広報課：渡辺、金城

電話：03-3501-1505

03-3501-5890

(参考)

【東北地方太平洋沖地震】

1. 災害概要

(1) 発生日時：平成 23 年 3 月 11 日（金） 14：46 発生

(2) 発生場所：震源三陸沖（北緯 38 度、東経 142.9 度）

深さ 10km、マグニチュード 9.0

(3) 各地の震度

○震度 4 以上の地域

震度 7 宮城県北部

震度 6 強 茨城県北部、茨城県南部

震度 5 強 青森県三八上北

震度 5 弱 新潟県中越

震度 4

○震度 4 以上の市町村

震度 6 強 福島県楢葉町、富岡町、大熊町、双葉町

震度 6 弱 宮城県石巻市、女川町（発電所の震度計による）、東海村

震度 5 弱 新潟県刈羽村

震度 4 青森県六ヶ所村、東通村、新潟県柏崎市、神奈川県横須賀市

震度 1 北海道泊村

From: Emche, Danielle
Sent: Tuesday, March 29, 2011 10:27 PM
To: LIA02 Hoc
Cc: LIA03 Hoc
Subject: Re: Sharing assumptions with Taiwan as well

Thank you for remembering. Let me clarify the situation. (Detailed notes and my POC and is phone number are in the turnover from Friday, 3-11 shift, I believe.). Jenny Tobin was working and may remember where to look, in case you can't find it. Somehow it got removed.

PMT was supposed to contact them directly by setting up something with my POC, JY, in advance. This is because my POC also has to coordinate the call with another colleague at TECRO per a DOS request. We also weren't sure Canada, UK, and France would be amenable to adding Taiwan. If PMT already vetted this with the other countries, then I suppose it is ok for Taiwan to join. Someone just needs to notify JY.

On another note, my computer issues are fixed and I think Jack Giessner is still trying to fix his issues.
Danielle
Sent from an NRC BlackBerry.

From: LIA02 Hoc
To: Emche, Danielle
Cc: LIA03 Hoc
Sent: Tue Mar 29 22:14:47 2011
Subject: RE: Sharing assumptions with Taiwan as well

Danielle –

Please provide us with the contact information for Taiwan and we will follow-up to have them dial in with the UK, Canada, and France. We know you may not have the number, but we can work this if we have the poc for Taiwan. By the way, who is your backup for Taiwan?

Thanks,

Gerri and Nancy

From: LIA02 Hoc
Sent: Tuesday, March 29, 2011 6:22 AM
To: 'Danielle Emche'
Subject: FW: Sharing assumptions with Taiwan as well

Danielle:

I visited the PMT & had them review their notes. According to their notes, they have not contacted Taiwan. We did however find this message to you. Were you to give Taiwan some dial-in info? It looks like both factions are expecting a response from the other.

Steve Baker

KKK12-107

From: Hoc, PMT12
Sent: Tuesday, March 29, 2011 4:57 AM
To: LIA02 Hoc
Subject: FW: Sharing assumptions with Taiwan as well

From: PMT07 Hoc
Sent: Thursday, March 24, 2011 6:54 PM
To: Emche, Danielle
Cc: Hoc, PMT12
Subject: FW: Sharing assumptions with Taiwan as well

Danielle,

Please include Taiwan into the daily calls we have with France, the UK and Canada, and provide them the dial-in info.

Thanks in advance.

From: PMT01 Hoc
Sent: Thursday, March 24, 2011 6:12 PM
To: Hoc, PMT12; PMT07 Hoc
Subject: FW: Sharing assumptions with Taiwan as well

From: LIA03 Hoc
Sent: Thursday, March 24, 2011 5:13 PM
To: PMT01 Hoc; PMT02 Hoc
Cc: Emche, Danielle
Subject: FW: Sharing assumptions with Taiwan as well

PMT guys,

Below is the response that I got as a result of a meeting that occurred today between OIP staff and AIT/TECRO (Taiwan). OIP indicates that the technical exchange arrangements are in place to share this information. I don't know if it would be better for you to contact them separately or if you just want to loop them into your calls with France, the UK and Canada. Danielle is interested in sitting in on that call and can put you in touch with the correct folks. Please let me know if you have any questions!

Thanks,
-Jenny

From: Emche, Danielle
Sent: Thursday, March 24, 2011 4:59 PM
To: LIA03 Hoc
Subject: RE: RI Request on TP re: coordination with Japanese Govt on PAR

Oh, yes! Thank you! We had a conversation and they want us to share the assumptions verbally, like we did with France, UK and Canada. The assistant secretary, DOS has also asked NRC to share this. Can you ask the PMT lead about a teleconference tomorrow to do a verbal? I could also listen in from home. We do have an arrangement for technical exchange now in place with Taiwan, so from OIP's standpoint, we're covered.
Danielle

From: LIA02 Hoc
Sent: Tuesday, March 29, 2011 6:30 AM
To: Giessner, John
Cc: LIA03 Hoc
Subject: RE: Laptop

John:

I called a technician who will be contacting you shortly. My apologies for not noticing your email for some 40 minutes.

Steve Baker

From: Giessner, John
Sent: Tuesday, March 29, 2011 5:41 AM
To: LIA02 Hoc
Cc: Heard, Robert; Jackson, Karen
Subject: RE: Laptop

We have questions about how to access citrix and re-assign laptops as the relief teams cycle in to Tokyo. In addition, due to sign on problems, some may be locked out or need to have something re-set. Can we pick a time to call and discuss? Danielle and I are both interested in discussing.

From: LIA02 Hoc
Sent: Thursday, March 24, 2011 1:34 PM
To: LIA02 Hoc; Giessner, John
Cc: ET02 Hoc; LIA03 Hoc
Subject: RE: Laptop

Jack,

When you get to Japan try and log onto one of the ones there and then send an email back to us and let us know the number for the laptop staying behind.

Steve

From: LIA02 Hoc
Sent: Thursday, March 24, 2011 1:12 PM
To: Giessner, John
Cc: ET02 Hoc; LIA03 Hoc
Subject: Laptop

Jack,

We are not able to get you a laptop, as the 2 last people are carrying their own and will not be able to take you one. We are looking into having the 1st leave one of theirs for you to work on.

steve

KKKK-108

From: ET02 Hoc
Sent: Tuesday, March 29, 2011 7:50 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: FW: Laptops in Japan

From: ET02 Hoc
Sent: Tuesday, March 29, 2011 6:08 PM
To: Monninger, John; Dorman, Dan; Devercelly, Richard; Casto, Chuck; Blamey, Alan; Jackson, Todd; Scott, Michael; Cook, William; Smith, Brooke; Way, Ralph; Taylor, Robert; Miller, Marie; Giessner, John; Ali, Syed; Sheikh, Abdul; Emche, Danielle; Stahl, Eric
Subject: Laptops in Japan

All,

We have heard that there are some issues with using Citrix and also the air cards sent with the laptops prepared for the travelers to Japan. An international air card was sent with each laptop. If you have not found them all, please do a thorough search of all pockets in the laptop bags. I apologize if this information is a repeat of what you already know but want to be sure that you all can use the laptops. The initial laptop logon is configured in one of two ways: to either require a password or not. If prompted for a logon and password at boot up, enter either Japan1 or Japan2 as the user name and then use the password provided in the blue envelope. Use this same set of user names and passwords at the Windows logon. When launching Citrix, choose the Japan1 digital certificate from the list and then logon to Citrix with your NRC personal account. As of the time of this email, none of your accounts were locked out. The NRC help desk is available 24x7 at 301-415-1234.

Hope this helps

From: LIA03 Hoc
Sent: Wednesday, March 30, 2011 5:03 AM
To: Doane, Margaret
Cc: LIA03 Hoc
Subject: Report from the Japan Team on March 30, 2011
Attachments: MDoane report 3-30.doc

Margie:

Attached is the daily report from the OIP team this morning.

Steve Baker

KKKK-110

Wednesday, March 30, 2011

For the morning Chairman brief read-out

The daily Cabinet Meeting is now being held every other day (i.e., tonight's was cancelled). The reduced frequency of the meeting reflects a sense of increased stability. Danielle and Eric met their counterparts and were Introduced as the new team to replace Kirk and Brooke.

In the NISA/TEPCO daily meeting, TEPCO reported out specifics about the status of each unit and reactor and NRC provided additional advice based on the established priorities and associated strategies. The meeting was fruitful and discussion was free flowing and effective.

NRC is getting out of coordinating discussions with TEPCO and industry. INPO is now taking lead for US industry. INPO will have a representative embedded in TEPCO.

The onsite NRC staff is working to resolve the many duplicate tasking efforts and US interagency coordinating requests.

Steve Baker

From: LIA02 Hoc
Sent: Sunday, March 27, 2011 4:25 PM
To: RST01 Hoc; RST02 Hoc
Cc: LIA03 Hoc
Subject: FW: Plant parameter data English translation
Attachments: FukushimaF1 parameters March 27.docx; Plant Parameter Data1.pdf

RST,
Here is a translated document of reactor unit parameters. Please let us know if you have questions or need anything else.

Thanks!
-Jenny

From: LIA10 Hoc
Sent: Sunday, March 27, 2011 4:14 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: Plant parameter data English translation

Plant parameter data English translation and the source document attached

KKKK-111

福島第一原子力発電所 プラント関連パラメータ

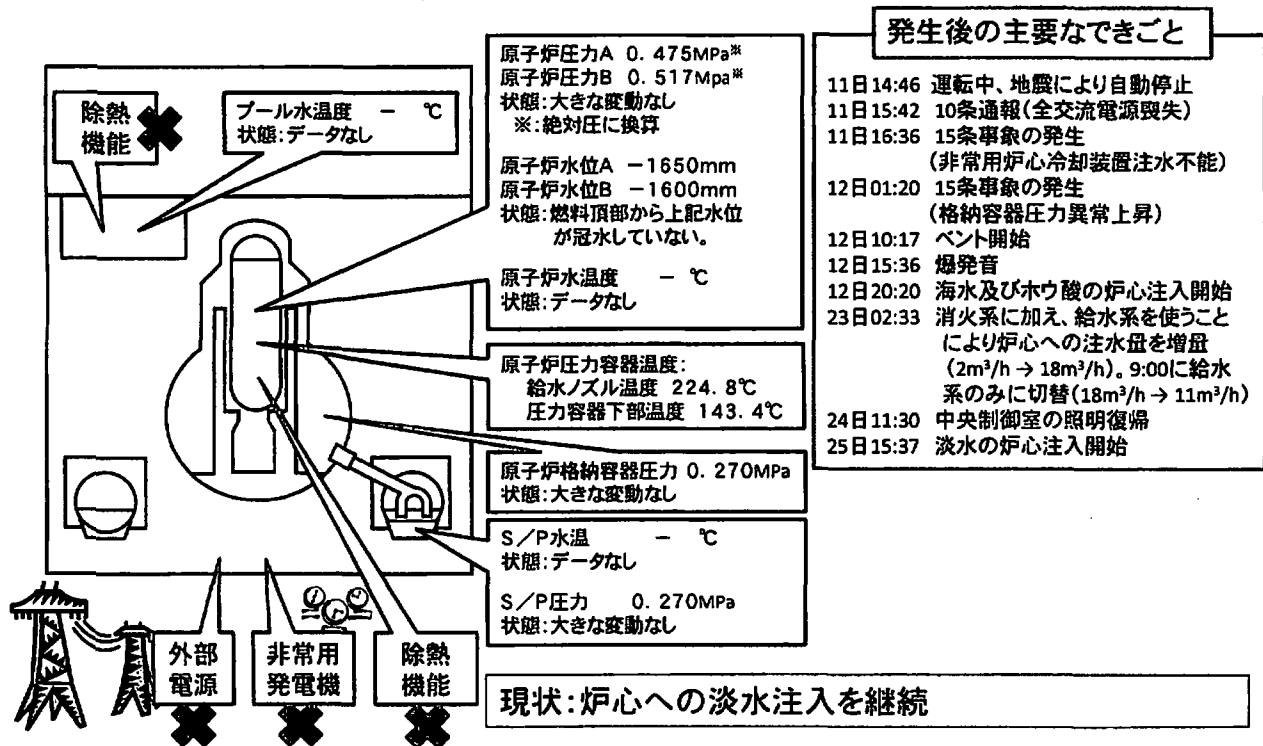
3月27日 14:00 現在

※1: 計器不良
※2: データ採取対象外

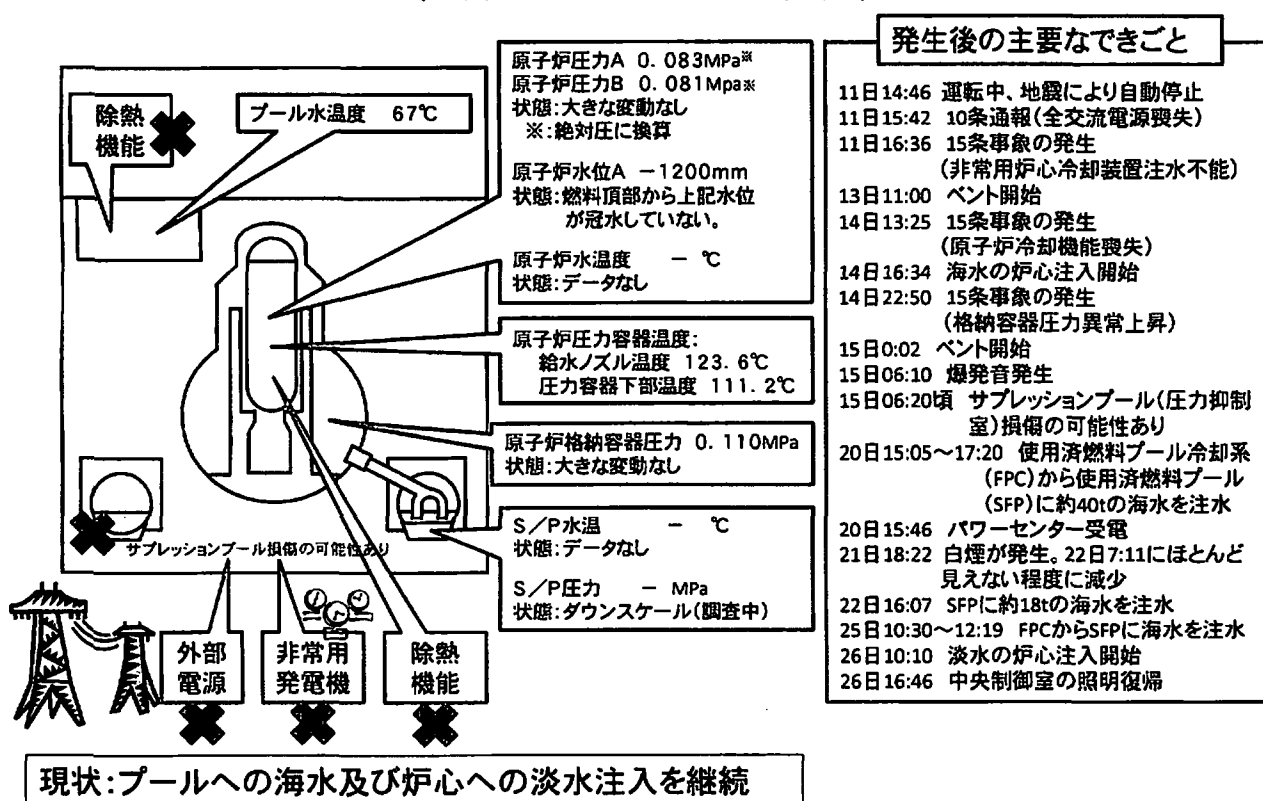
号機	1u	2u	3u	4u	5u	6u
注水状況	給水ポンプを用いた淡水注入中。 流量 120l/min (3/25 15:37) 仮設計器	消火ポンプを用いた淡水注入中。 流量 270~280l/min (3/26 17:22) 仮設計器	消火ポンプを用いた淡水注入中。 流量 220l/min (3/26 18:00) 仮設計器	停止中	停止中	停止中
原子炉水位	燃料域A: -1650mm 燃料域B: -1600mm (3/27 9:00 現在)	燃料域A: -1200mm (3/27 9:00 現在)	燃料域A: -1900mm 燃料域B: -2300mm (3/27 10:10 現在)	※2	停止域 1930mm (3/27 14:00 現在)	停止域 2035mm (3/27 14:00 現在)
原子炉圧力	0.374MPa g (A) 0.416MPa g (B) (3/27 9:00 現在)	-0.018MPa g (A) -0.020MPa g (B) (3/27 9:00 現在)	0.032MPa g (A) -0.099MPa g (C) (3/27 10:10 現在)	※2	0.007MPa g (3/27 14:00 現在)	0.005MPa g (3/27 14:00 現在)
原子炉水温度	(系統流量がないため採取不可)			※2	30.3℃ (3/27 14:00 現在)	29.1℃ (3/27 14:00 現在)
原子炉圧力容器 温度	給水ノズル温度: 224.8℃ 圧力容器下部温度: 143.4℃ (3/27 9:00 現在)	給水ノズル温度: 123.6℃ 圧力容器下部温度: 111.2℃ (3/27 9:00 現在)	給水ノズル温度: 13.6℃(調査中) 圧力容器下部温度: 121.6℃ (3/27 10:10 現在)	4u: 原子炉内に発熱体(燃料)なし 5,6u: 原子炉水温度にて監視中		
D/W・S/C圧力	D/W 0.270MPa abs S/C 0.270MPa abs (3/27 9:00 現在)	D/W 0.110MPa abs S/C ダウンスケール(調査中) (3/27 9:00 現在)	D/W 0.1076MPa abs S/C 0.1806MPa abs (3/27 10:10 現在)	※2		
CAMS	D/W 3.46×10 ⁵ Sv/h S/C 2.22×10 ⁵ Sv/h (3/27 9:00 現在)	D/W 4.16×10 ⁵ Sv/h S/C 1.41×10 ⁵ Sv/h (3/27 9:00 現在)	D/W 3.37×10 ⁵ Sv/h S/C 1.31×10 ⁵ Sv/h (3/27 10:10 現在)	※2		
D/W 設計使用圧力	0.384MPa g(0.485MPa abs)	0.384MPa g(0.485MPa abs)	0.384MPa g(0.485MPa abs)	※2		
D/W 最高使用圧力	0.427MPa g(0.528MPa abs)	0.427MPa g(0.528MPa abs)	0.427MPa g(0.528MPa abs)			
使用済燃料プール	※1	67℃ (3/27 9:00 現在)	※1	※1	37.8℃ (3/27 14:00 現在)	21.0℃ (3/27 14:00 現在)
FPC 777-91247 バルブ	4500mm (3/27 9:00 現在)	5750mm (3/27 9:00 現在)	※1	5850mm (3/27 10:10 現在)	※2	
電源	外部電源受電中 (P/C2C)			外部電源受電中 (P/C4D)		外部電源受電中
その他情報	3号機 原子炉圧力容器温度について、データ採取を行い、状況推移を継続調査中。 2号機 S/C圧力について、状況推移を継続調査中。			共用プール: 39℃程度 (3/27 08:00)		

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

福島第一原子力発電所1号機の状況 (3月27日 14:00現在)

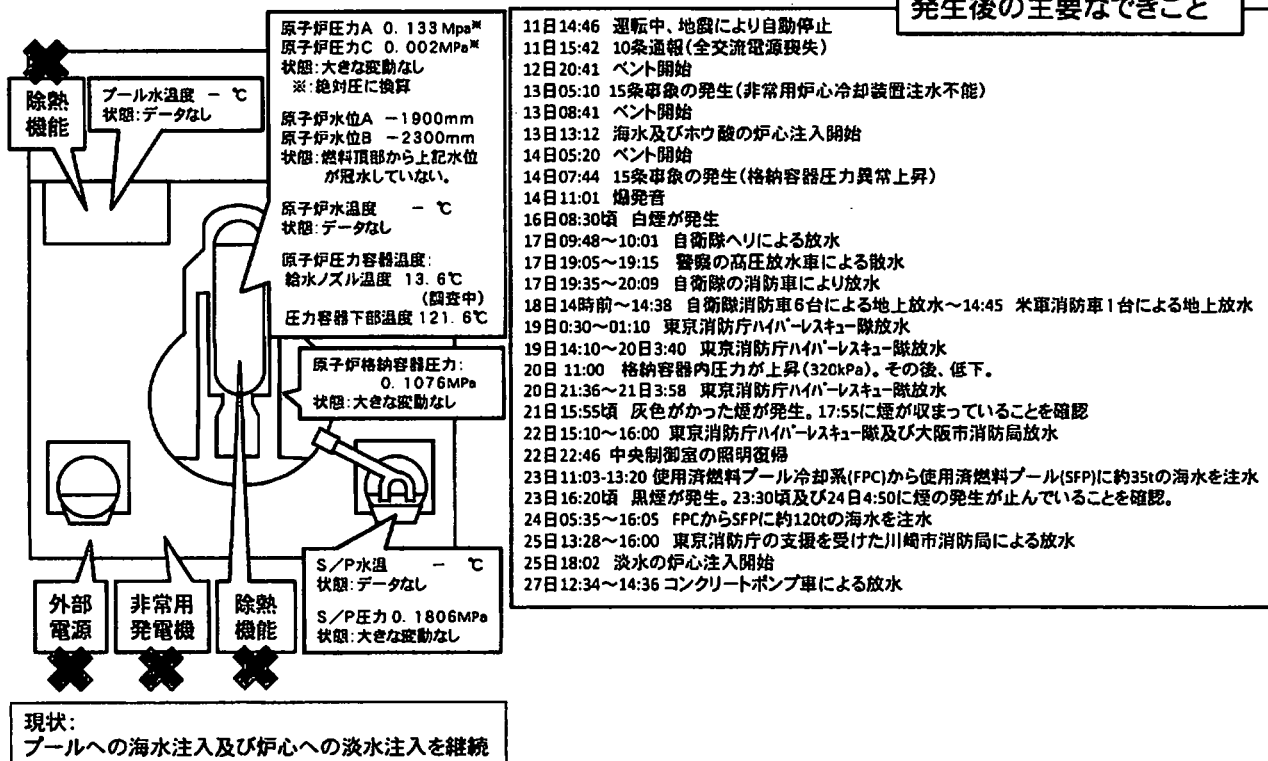


福島第一原子力発電所2号機の状況 (3月27日 14:00現在)



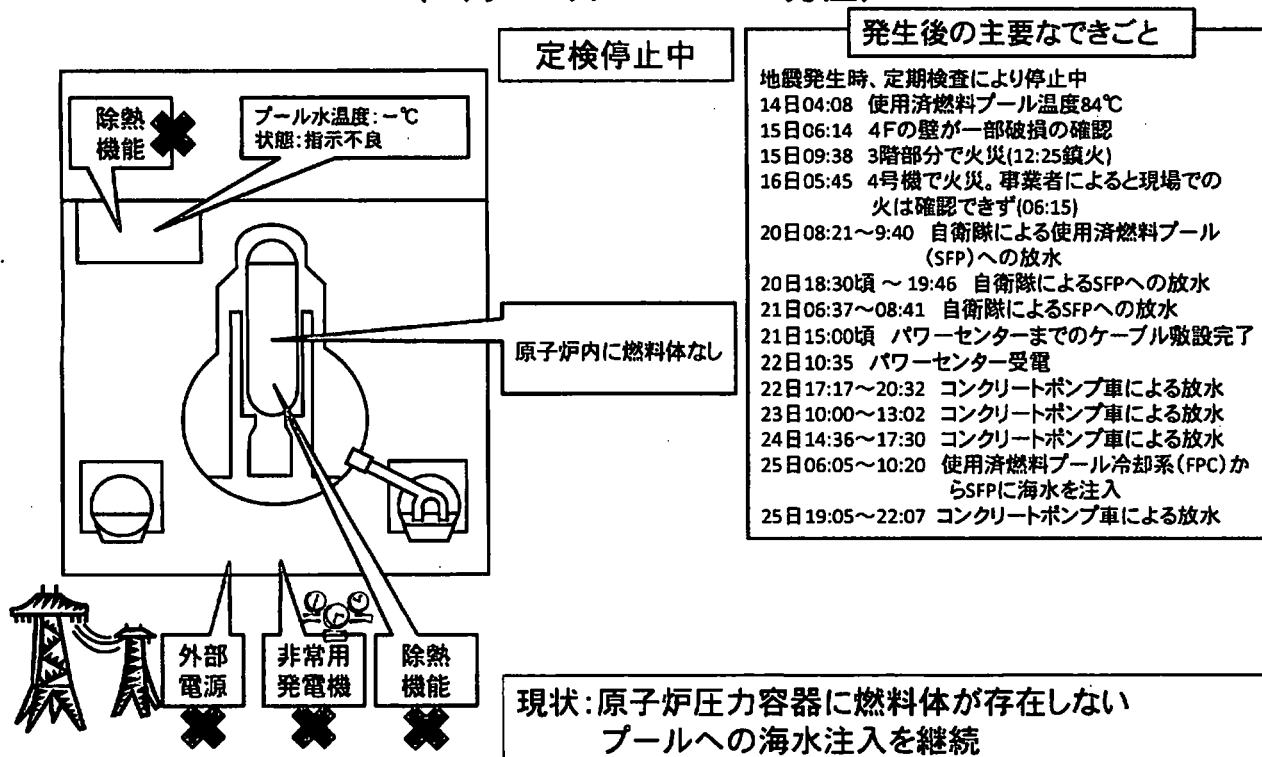
福島第一原子力発電所3号機の状況

(3月27日 14:00現在)

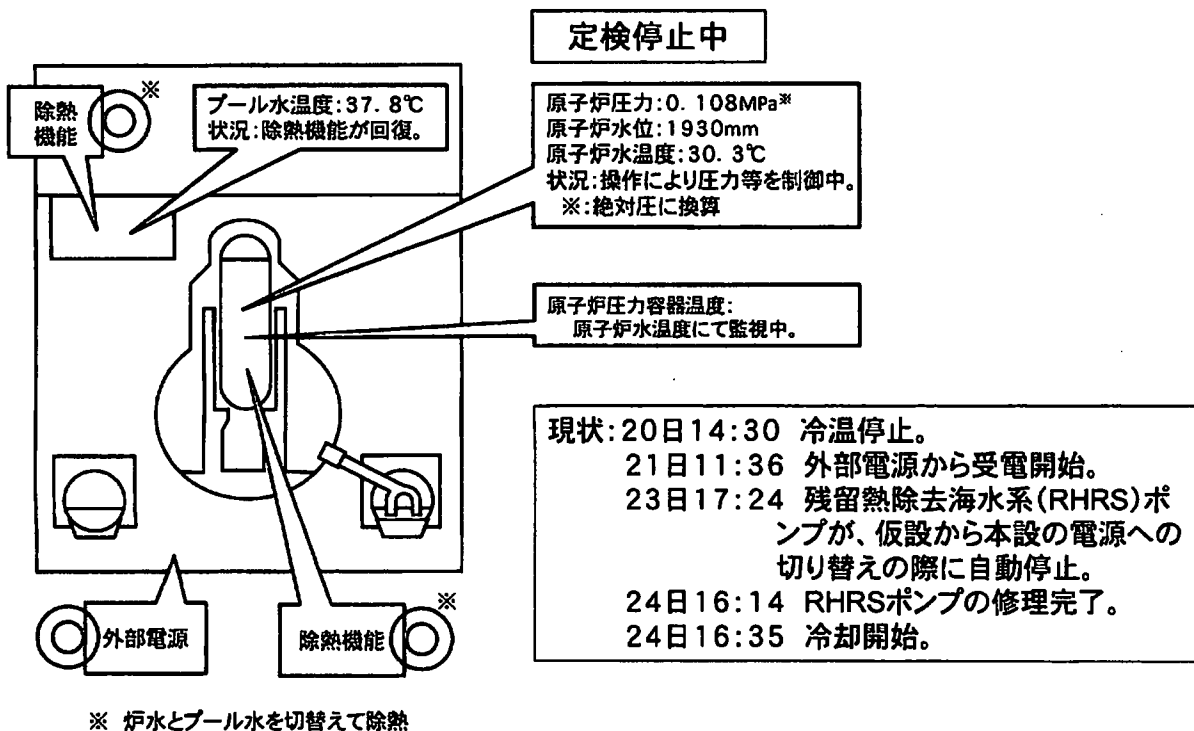


福島第一原子力発電所4号機の状況

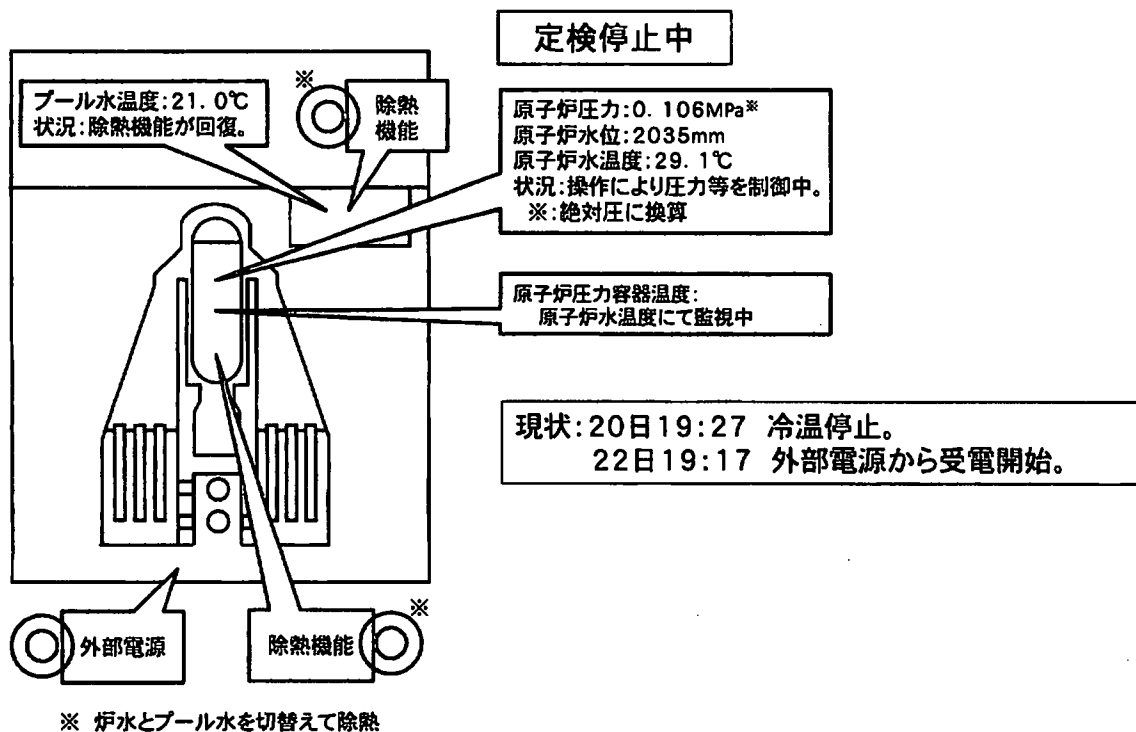
(3月27日 14:00現在)



福島第一原子力発電所5号機の状況 (3月27日 14:00現在)



福島第一原子力発電所6号機の状況 (3月27日 14:00現在)



Fukushima Dai-ichi (F-1) Major Plant Parameter
As of 14:00 March 27

*1 : Meter defect

*2: Outside of data sampling scope

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Conditions of water injection	Fresh water injection water supply line flow rate : 120 l/min (March 25, 15:37) Temporary installed meter	Fresh water injection through fire extinguish line flow rate : 270 ~280 l/min (March 26, 17:22) Temporary installed meter	Fresh water injection through fire extinguish line Flow rate: 220 l/min (March 26, 18:00) Temporary installed meter	Currently shut down	Currently shut down	Currently shut down
Reactor Water level	Fuel area A: minus 1650 mm Fuel area B: minus 1600 mm (as of March 27, 9:00)	Fuel area A: minus 1200 mm (as of March 27 9:00)	Fuel area A: minus 1900 mm Fuel area B: minus 2300 mm (as of March 27,10:10)	*2	Shut down area 1930 mm (as of March 27, 14:00)	Shut down area 2035 mm (as of March 27, 14:00)
Reactor pressure	0.374 MPag (A) 0.416 MPag (B) (as of March 27, 9:00)	Minus 0.018 MPag (A) Minus 0.020 MPag (B) (as of March 27, 9:00)	0.032 MPag (A) minus 0.099 MPag (C) (as of March 27, 10:10)	*2	0.007 MPag (as of March 27, 14:00)	0.005 MPag (as of March 27, 14:00)
Reactor water temperature	(Sampling is not possible because of no grid flow rate)			*2	30.3°C (as of 3/27 14:00)	29.1°C (as of 3/27 14:00)
Reactor Pressure Vessel temperature	Water supply nozzle temperature: 224.8°C RPV lower section temperature: 143.4°C (as of March 27,	Water supply nozzle temperature: 123.6°C RPV lower section temperature: 111.2°C (as of March 27, 9:00)	Water supply nozzle temperature: 13.6°C (monitoring) RPV lower section temperature: 121.6°C (as of March 27, 10:10)	Unit 4: No heating element (fuel) inside reactor Units 5, 6: Monitoring reactor water temperature		

	9:00)					
D/W, S/C pressure	D/W: 0.270 MPa abs S/C: 0.270 MPa abs (as of 3/27 9:00)	D/W: 0.110 MPa abs S/C: below measurement scale (as of 3/27 9:00)	D/W: 0.1076 MPa abs S/C: 0.1806 MPa abs (as of 3/27 10:10)	*2		
CAMS	D/W: 3.46 x 10 ¹ Sv/h S/C: 2.22 x 10 ¹ Sv/h (as of 3/27 9:00)	D/W: 4.16 x 10 ¹ Sv/h S/C: 1.41 x 10 ⁰ Sv/h (as of 3/27 9:00)	D/W: 3.37 x 10 ¹ Sv/h S/C: 1.31 x 10 ⁰ Sv/h (as of 3/27 10:10)	*2		
D/W design utilization pressure	0.384 MPag (0.485 MPa abs)	0.384 MPag (0.485 MPa abs)	0.384 MPag (0.485 MPa abs)	*2		
D/W maximum utilization pressure	0.427 MPag (0.528 MPa abs)	0.427 MPag (0.528 MPa abs)	0.427 MPag (0.528 MPa abs)			
SNF pool	*1	67°C (as of 3/27 9:00)	*1	*1	37.8° C (as of 3/27 14:00)	21.0 °C (as of 3/27 14:00)
FPC skimmer reader tank level	4500 mm (as of 3/27 9:00)	5750 m (as of 3/27 9:00)	*1	5850 mm (as of 3/27 10:10)	*2	
Power sources	Currently receiving electricity from external power sources (P/C2C)		Currently receiving electricity from external power sources (P/C4D)		Currently receiving electricity from external power sources	
Other information	Unit 3: With regard to RPV temperature, data sampling is conducted, and investigation on the change of the situation is continuing. Unit 2: With regard to S/C, investigation on the change of the situation is continuing.			Common use pool: about 39°C (3/27 08:00)		

Pressure value conversion:

Gauge pressure (MPa g) = Absolute pressure (MPa abs) – Atmospheric pressure (standard atmospheric pressure 0.1013 MPa)

Absolute pressure (MPa abs) = Gauge pressure (MPa g) + Atmospheric pressure (standard atmospheric pressure 0.1013 MPa)

From: LIA08 Hoc
Sent: Monday, March 28, 2011 1:22 PM
To: Weber, Michael; Blount, Tom; LIA06 Hoc
Subject: FW: 50 Mile EPZ justification response

This is from the gentlemen who asked Bill B. the questions about the 50 mile PAR for US citizens in Japan. He received our response. FYI. Jeff temple

From: INUTSUKA TAKASHI [mailto:takashi.inutsuka@mofa.go.jp]
Sent: Monday, March 28, 2011 1:04 PM
To: LIA03 Hoc
Cc: Doane, Margaret; Mamish, Nader; LIA02 Hoc; LIA08 Hoc; Borchardt, Bill
Subject: RE: 50 Mile EPZ justification response

Thank you very much.

Sincerely yours,

Takashi Inutsuka
Chief of Science Section
Science Counselor
Embassy of Japan
Tel: 202-238-6920
Fax: 202-462-1118

From: Hoc, PMT12
Sent: Monday, March 28, 2011 7:39 PM
To: PMT03 Hoc
Subject: FW: SONGS Samples for 3/28/11

From: Mike.McBrearty@sce.com [mailto:Mike.McBrearty@sce.com]
Sent: Monday, March 28, 2011 7:35 PM
To: Hoc, PMT12; HOO Hoc
Subject: SONGS Samples for 3/28/11

Below are the results of SONGS air samples for 3/28/11:

The measured concentration of I-131 ranged from 2E-13 to 3E-13 microcuries/cc.

The measured concentration of
Cs-137 was below minimum detectable limits.

Mike McBrearty
Nuclear Regulatory Affairs
San Onofre Nuclear Generating Station
858-945-0073

From: LIA02 Hoc
Sent: Monday, March 28, 2011 12:41 PM
To: Evans, Michele
Cc: LIA03 Hoc
Subject: RE: RETURN checklist.docx

Thanks.

From: Evans, Michele
Sent: Monday, March 28, 2011 12:28 PM
To: LIA02 Hoc
Cc: LIA03 Hoc
Subject: RE: RETURN checklist.docx

Yes, please provide it.

From: LIA02 Hoc
Sent: Monday, March 28, 2011 10:22 AM
To: Evans, Michele
Cc: LIA03 Hoc
Subject: FW: RETURN checklist.docx

Michele,

Are you comfortable with us sending out this document to the travelers who will be coming back starting today?

Thanks,

Cheers,

Karen

From: LIA02 Hoc
Sent: Sunday, March 27, 2011 8:30 PM
To: Evans, Michele
Cc: Schwartzman, Jennifer
Subject: RETURN checklist.docx

Michele,
Revised slightly (new #7). Please let me know if you want me to send this out to the first wave of travelers that are coming back.

Thanks!
-Jenny

KKKK-114

NRC Japan Team Return Checklist	
	Completed
1. Prompt Communication of Urgent Information - Urgent information should be communicated during the trip or immediately upon return to Ops Center staff.	
2. Return International Blackberry and Calling Cards, if necessary – Contact Karen Jackson at 415-6398	
3. Return Passport (if traveling with official) – Contact Kia Jackson at 415-1690	
4. Return dosimetry - Contact Undine Shoop at 301-415-2063 or your Regional RSO.	
5. Debrief <ul style="list-style-type: none"> ○ Office Management ○ Ops Center Personnel (Executive Team/Protective Measures Team/Reactor Safety Team, as appropriate) 	
6. Check-in with Health Center – (1) the Office of Human Resources strongly recommends that all returning employees check in with the Employee Assistance Program (EAP) for a Critical Incident Stress Debrief. Contact Sarah.Linnerooth@nrc.gov ; (2) return KI tablets	
7. Contact HR - to review hours of duty and premium pay entitlements, Larry Davidson, Lawrence.davidson@nrc.gov , 301-492-2286	

From: LIA02 Hoc
Sent: Saturday, March 26, 2011 11:32 AM
To: Foggie, Kirk; Smith, Brooke; Emche, Danielle; Stahl, Eric
Cc: LIA03 Hoc
Subject: Chuck Casto phone call with ET.

Started with ET and Chairman

Meeting Notes:

Being asked by Ambassador for recommendation on whether we should flood the dry wells on 1 2 and 3. Wants to get Chuck on the line.

The strategy paper will address this. The concern is Unit 1. The unit 1 containment is not inerted. If you flood the containment then you may compress hydrogen gas in the top of the containment causing an explosion. In general the SAM-G's say to flood the containment, but you don't want to block the vent path, and there is concern about the hydrogen ignition.

Chuck - Should flood the dry well on units 2 and 3, and should be cautious on unit 1. Recommendation on 1 - Try to inert the dry well, and if you can't do that then flood it. 2 and 3 are likely venting.

We also heard reports that there was water in the basements of unit 2 and 3. Unit 1 was de-watered and wasn't contaminated. Unit 3 had fission products which must be concerned.

Jim will send that to these recommendations in an email. Chuck will review the email before it goes to the Chairman.

Steve

KKKK-115

From: LIA03 Hoc
Sent: Tuesday, March 29, 2011 5:42 AM
To: Shaffer, Mark R; LIA02 Hoc
Cc: Schwartzman, Jennifer; LIA03 Hoc
Subject: RE: Plan for removal of water from basement(s)

Mark:

We are checking on this right now. I hope to have something for you shortly.

Steve Baker

From: Shaffer, Mark R [mailto:ShafferMr@state.gov]
Sent: Tuesday, March 29, 2011 5:26 AM
To: LIA02 Hoc; LIA03 Hoc
Cc: Schwartzman, Jennifer
Subject: Plan for removal of water from basement(s)

Ambassador is looking for any information regarding "the plan" for removal of water from the basements in Unit 1, 2 and 3. All the reports we are getting (including the one I get from NRC) only says Japan is working on it, but there are difficulties (trenches are full, adding concrete blocks and sandbags, etc.)? Surely there is a specific game plan that has been devised, or is being devised to deal with this situation. Can you please share this with me so I can provide to folks over here. Thanks!

This email is UNCLASSIFIED.

KKKK-116

From: Shaffer, Mark R <ShafferMr@state.gov>
Sent: Tuesday, March 29, 2011 12:16 PM
To: Jones, Cynthia; Schwartzman, Jennifer; LIA02 Hoc; LIA03 Hoc
Cc: Mamish, Nader; Temple, Jeffrey
Subject: RE: QUESTION FROM WARREN STERN & ENAC

The first document was posted up on ENAC at 10:20 am on March 11, which provided the status of each unit, etc. Maybe I'm missing something here too? But...I'll let you guys sort this out...

This email is UNCLASSIFIED.

From: Jones, Cynthia [mailto:Cynthia.Jones@nrc.gov]
Sent: Tuesday, March 29, 2011 2:35 PM
To: Schwartzman, Jennifer; Shaffer, Mark R; LIA02 Hoc; LIA03 Hoc
Cc: Mamish, Nader; Temple, Jeffrey
Subject: RE: QUESTION FROM WARREN STERN & ENAC

Two weeks ago there was nothing..... (The first weekend)

From: Schwartzman, Jennifer
Sent: Tuesday, March 29, 2011 8:35 AM
To: Jones, Cynthia; Shaffer, Mark R; LIA02 Hoc; LIA03 Hoc
Cc: Mamish, Nader; Temple, Jeffrey
Subject: RE: QUESTION FROM WARREN STERN & ENAC

Cyndi,

I'm confused - do you mean there was nothing on ENAC regarding the Japanese earthquake? We've been tracking it daily since the afternoon of March 11 and it's got a whole host of information. I might be reading your message wrong.

From: Jones, Cynthia
Sent: Tuesday, March 29, 2011 8:03 AM
To: Shaffer, Mark R; LIA02 Hoc; LIA03 Hoc
Cc: Schwartzman, Jennifer; Mamish, Nader; Temple, Jeffrey
Subject: RE: QUESTION FROM WARREN STERN & ENAC

I'll follow up this AM with Jeff Temple and get back to Warren.

When NRC got access to ENAC (I will be the ENAC NRC National contact) 2 weeks ago, there was no info on the website for the event. I'll get with Jeff and respond-

Cyndi

From: Shaffer, Mark R [mailto:ShafferMr@state.gov]
Sent: Tuesday, March 29, 2011 2:11 AM
To: LIA02 Hoc; LIA03 Hoc

KKKK-117

Cc: Schwartzman, Jennifer; Mamish, Nader; Jones, Cynthia

Subject: QUESTION FROM WARREN STERN

Dear LIA02.HOC:

Please have Jennifer Schwartzman brief you (and Cyndi Jones) regarding the ongoing discussion between Warren Stern and Ambassador Davies on the topic below noted in the recent transition log:

DHS Request: Received request from DHS/Stern (to Cyndi Jones) on 3/28 at 1912. Stern wants to know "does NRC have access to IAEA Measured Data on ENAC (not the Japanese data)". PMT was unable to provide a response as to whether or not they use the IAEA data and ENAC search showed only Japanese data. Responded back to Cyndi Jones at 2141 with that information and inquired if anyone else would have access to IAEA information within the PMT. Action follow-up pending Cyndi's response.

Obviously I can't say whether NRC's PMT uses the IAEA monitoring data; however, the information is available to NRC, Mr. Stern or anyone else who has a computer, through IAEA's public web site. Note that the IAEA teams have been taking confirmatory measurements (alongside Japan) as well as independent measurements. For the most part these have consisted of dose rate measurements at various locations. Their results have been substantially similar to the data that is being provided by Japan, and posted on ENAC. The environmental samples (air and soil) taken by the IAEA team have just been sent to Siebersdorf laboratories, and the results are not yet available. These too will be posted on the public web site when analyzed and reported.

I would point Mr. Stern to IAEA's public web site that posts the Fukushima Nuclear Accident Update Log. This log provides daily updates and posts the actual IAEA presentations that are used to brief Member States every day at 3:00 pm, including the IAEA monitoring team's data:

<http://www.iaea.org/newscenter/news/tsunamiupdate01.html>. This link gets you to the log, which will also have links to the presentations. Take a look at the presentation entitled, Radiological Consequences of the Fukushima Nuclear Accident - 28 March 2011," This provides all the details on IAEA's monitoring team.

Hope this helps!

This email is UNCLASSIFIED.

From: Temple, Jeffrey
Sent: Wednesday, March 30, 2011 11:48 AM
To: Schwartzman, Jennifer; Jones, Cynthia; Shaffer, Mark R; LIA02 Hoc; LIA03 Hoc
Cc: Mamish, Nader
Subject: RE: QUESTION FROM WARREN STERN & ENAC

When we first logged into IAEAs website, we could not log on to ENAC and there was little to no information about the Japan event. We then logged on to the ENAC site using the user name and password generated for our HOOs, and have had good luck ever since with the ENAC site. As far as I know, there are no issues with receiving IAEA status info via ENAC, since we have been on the site. We still need access of our own (LIAISON TEAM) but are making do with the HOOs sign on capability. Jeff Temple

From: Schwartzman, Jennifer
Sent: Tuesday, March 29, 2011 8:35 AM
To: Jones, Cynthia; Shaffer, Mark R; LIA02 Hoc; LIA03 Hoc
Cc: Mamish, Nader; Temple, Jeffrey
Subject: RE: QUESTION FROM WARREN STERN & ENAC

Cyndi,

I'm confused – do you mean there was nothing on ENAC regarding the Japanese earthquake? We've been tracking it daily since the afternoon of March 11 and it's got a whole host of information. I might be reading your message wrong.

From: Jones, Cynthia
Sent: Tuesday, March 29, 2011 8:03 AM
To: Shaffer, Mark R; LIA02 Hoc; LIA03 Hoc
Cc: Schwartzman, Jennifer; Mamish, Nader; Temple, Jeffrey
Subject: RE: QUESTION FROM WARREN STERN & ENAC

I'll follow up this AM with Jeff Temple and get back to Warren.

When NRC got access to ENAC (I will be the ENAC NRC National contact) 2 weeks ago, there was no info on the website for the event. I'll get with Jeff and respond-

Cyndi

From: Shaffer, Mark R [mailto:ShafferMr@state.gov]
Sent: Tuesday, March 29, 2011 2:11 AM
To: LIA02 Hoc; LIA03 Hoc
Cc: Schwartzman, Jennifer; Mamish, Nader; Jones, Cynthia
Subject: QUESTION FROM WARREN STERN

Dear LIA02.HOC:

Please have Jennifer Schwartzman brief you (and Cyndi Jones) regarding the ongoing discussion between Warren Stern and Ambassador Davies on the topic below noted in the recent transition log:

DHS Request: Received request from DHS/Stern (to Cyndi Jones) on 3/28 at 1912. Stern wants to know "does NRC have access to IAEA Measured Data on ENAC (not the Japanese data)". PMT was unable to

KKKK-118

provide a response as to whether or not they use the IAEA data and ENAC search showed only Japanese data. Responded back to Cyndi Jones at 2141 with that information and inquired if anyone else would have access to IAEA information within the PMT. Action follow-up pending Cyndi's response.

Obviously I can't say whether NRC's PMT uses the IAEA monitoring data; however, the information is available to NRC, Mr. Stern or anyone else who has a computer, through IAEA's public web site. Note that the IAEA teams have been taking confirmatory measurements (alongside Japan) as well as independent measurements. For the most part these have consisted of dose rate measurements at various locations. Their results have been substantially similar to the data that is being provided by Japan, and posted on ENAC. The environmental samples (air and soil) taken by the IAEA team have just been sent to Siebersdorf laboratories, and the results are not yet available. These too will be posted on the public web site when analyzed and reported.

I would point Mr. Stern to IAEA's public web site that posts the Fukushima Nuclear Accident Update Log. This log provides daily updates and posts the actual IAEA presentations that are used to brief Member States every day at 3:00 pm, including the IAEA monitoring team's data:

<http://www.iaea.org/newscenter/news/tsunamiupdate01.html>. This link gets you to the log, which will also have links to the presentations. Take a look at the presentation entitled, "Radiological Consequences of the Fukushima Nuclear Accident - 28 March 2011," This provides all the details on IAEA's monitoring team.

Hope this helps!

This email is UNCLASSIFIED.

From: ET07 Hoc
Sent: Wednesday, March 30, 2011 5:11 AM
To: ET02 Hoc
Subject: FW: Doc2.docx
Attachments: Doc2.docx

From: Morris, Scott
Sent: Wednesday, March 30, 2011 4:26 AM
To: ET07 Hoc
Subject: Doc2.docx

1/1111-119

TURNOVER CHECKLIST

DATE:

TIME:

POSITION:

STATUS: (FACILITY/DOSE ASSESSMENTS)

CURRENT PRIORITIES:

ACTIONS ACCOMPLISHED DURING SHIFT:

PLANNED/CONTINUING ACTIONS:

CHALLENGES:

SIGNIFICANT POLICY/PROCESS DECISIONS MADE:

Offgoing Watchstander

Oncoming Watchstander

From: LIA07 Hoc
Sent: Wednesday, March 30, 2011 8:27 AM
To: LIA07 Hoc; Borchardt, Bill; Bradford, Anna; Cohen, Shari; Collins, Elmo; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Jaczko, Gregory; Johnson, Michael; Leeds, Eric; Loyd, Susan; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walker, Dwight; Walls, Lorena; Weber, Michael
Subject: Updates for Go Book - 0820 EDT March 30, 2011
Attachments: ET Chronology 3-30-11 0600.pdf; March 30 0600 EDT one pager.pdf

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

The updates include:

- The latest ET Chronology (for the last 24 hours)
- The latest One Pager (0600 EDT March 30)

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

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

KKKK-120

From: Emche, Danielle
Sent: Wednesday, March 30, 2011 4:37 AM
To: LIA03 Hoc; Stahl, Eric; Smith, Brooke
Subject: RE: Draft text for a brief report to MMD

Hi Steve, thank you!

From: LIA03 Hoc
Sent: Wednesday, March 30, 2011 4:12 AM
To: Emche, Danielle; Stahl, Eric; Smith, Brooke
Subject: Draft text for a brief report to MMD

Margie:

Attached is a summary of activities gleaned from Brooke, Danielle and Eric.

The daily Cabinet Meeting is now being held every other day (i.e., tonight's was cancelled). The reduced frequency of the meeting reflects a sense of increased stability. Danielle and Eric met their counterparts and were introduced as the new team to replace Kirk and Brooke.

In the NISA/TEPCO daily meeting, TEPCO reported out specifics about the status of each unit and reactor and NRC provided additional advice based on the established priorities and associated strategies. The meeting was fruitful and discussion was free flowing and effective.

NRC is getting out of coordinating discussions with TEPCO and industry. INPO is now taking lead for US industry. INPO will have a representative embedded in TEPCO.

The onsite NRC staff is working to resolve the many duplicate tasking efforts and US interagency coordinating requests.

Steve Baker

I intend to put the above text into an MSWord attachment to Margie.

From: Shaffer, Mark R <ShafferMr@state.gov>
Sent: Wednesday, March 30, 2011 4:26 AM
To: LIA03 Hoc; LIA02 Hoc
Subject: RE: Plan for removal of water from basement(s)

Three hours have passed so I'm giving it one more try....anything you can give me before my meeting in a couple of minutes??

This email is UNCLASSIFIED.

From: Shaffer, Mark R
Sent: Wednesday, March 30, 2011 7:32 AM
To: Shaffer, Mark R; 'LIA03 Hoc'; 'LIA02 Hoc'
Cc: 'Schwartzman, Jennifer'; 'Robert Caldwell'
Subject: RE: Plan for removal of water from basement(s)

Still no answer? I meet again with the Ambassador to discuss this in a couple of hours. I'm not looking for detailed drawings and flow charts, I just need a brief overview of what the plan(s) are to remove the water. At the very least I need the "various options that are being considered," as mentioned in your note below." Thank you.

This email is UNCLASSIFIED.

From: Shaffer, Mark R
Sent: Tuesday, March 29, 2011 6:41 PM
To: 'LIA03 Hoc'; LIA02 Hoc
Cc: Schwartzman, Jennifer
Subject: RE: Plan for removal of water from basement(s)

My meeting with the Ambassador on the subject has already come and gone...I told him I would get back to them when I get some clarity from NRC. So, the time line is as soon as you can provide it. I meet with him next tomorrow morning (it is 6:45 pm here in Vienna now), and I expect it will come up. Thanks!

This email is UNCLASSIFIED.

From: LIA03 Hoc [mailto:LIA03.Hoc@nrc.gov]
Sent: Tuesday, March 29, 2011 12:20 PM
To: Shaffer, Mark R; LIA02 Hoc

KKKK-122

Cc: Schwartzman, Jennifer; LIA03 Hoc

Subject: RE: Plan for removal of water from basement(s)

Mark:

The LT Director (Bob Caldwell) just spoke to both the PMT and RST. At this time, there is no specific plan for removal of the water in Units 1,2, and 3. While options are being considered, we do not have anything to share with you at this time.

What time constraints are you working under for delivery of some possible options?

Steve Baker

From: Shaffer, Mark R [mailto:ShafferMr@state.gov]

Sent: Tuesday, March 29, 2011 5:26 AM

To: LIA02 Hoc; LIA03 Hoc

Cc: Schwartzman, Jennifer

Subject: Plan for removal of water from basement(s)

Ambassador is looking for any information regarding "the plan" for removal of water from the basements in Unit 1, 2 and 3. All the reports we are getting (including the one I get from NRC) only says Japan is working on it, but there are difficulties (trenches are full, adding concrete blocks and sandbags, etc.)? Surely there is a specific game plan that has been devised, or is being devised to deal with this situation. Can you please share this with me so I can provide to folks over here. Thanks!

This email is UNCLASSIFIED.

From: LIA02 Hoc
Sent: Wednesday, March 30, 2011 4:51 AM
To: LIA08 Hoc; LIA06 Hoc
Subject: FW: Plan for removal of water from basement(s)

From: LIA02 Hoc
Sent: Wednesday, March 30, 2011 4:39 AM
To: 'Shaffer, Mark R'; LIA03 Hoc
Cc: Schwartzman, Jennifer; Caldwell, Robert
Subject: RE: Plan for removal of water from basement(s)

Mark:

In response to your inquiry, Bob just reported back from the RST. The Site team in Japan reports that the current plan is to pump the basement water to the available hotwells and other tanks onsite. Additionally, US forces in Japan are expected to supply bladders and other additional temporary storage.

Longer term plans are being considered in the US such as temporary rad waste processing skids, temporary holding tanks and tanker trucks. DOE is also investigating whether there is a technology to absorb contaminated materials from water.

LIA02 (Steve Baker)

From: Shaffer, Mark R [mailto:ShafferMr@state.gov]
Sent: Wednesday, March 30, 2011 1:32 AM
To: Shaffer, Mark R; LIA03 Hoc; LIA02 Hoc
Cc: Schwartzman, Jennifer; Caldwell, Robert
Subject: RE: Plan for removal of water from basement(s)

Still no answer? I meet again with the Ambassador to discuss this in a couple of hours. I'm not looking for detailed drawings and flow charts, I just need a brief overview of what the plan(s) are to remove the water. At the very least I need the "various options that are being considered," as mentioned in your note below." Thank you.

This email is UNCLASSIFIED.

From: Shaffer, Mark R
Sent: Tuesday, March 29, 2011 6:41 PM
To: 'LIA03 Hoc'; LIA02 Hoc
Cc: Schwartzman, Jennifer
Subject: RE: Plan for removal of water from basement(s)

KKK/C-123

My meeting with the Ambassador on the subject has already come and gone...I told him I would get back to them when I get some clarity from NRC. So, the time line is as soon as you can provide it. I meet with him next tomorrow morning (it is 6:45 pm here in Vienna now), and I expect it will come up. Thanks!

This email is UNCLASSIFIED.

From: LIA03 Hoc [mailto:LIA03.Hoc@nrc.gov]
Sent: Tuesday, March 29, 2011 12:20 PM
To: Shaffer, Mark R; LIA02 Hoc
Cc: Schwartzman, Jennifer; LIA03 Hoc
Subject: RE: Plan for removal of water from basement(s)

Mark:

The LT Director (Bob Caldwell) just spoke to both the PMT and RST. At this time, there is no specific plan for removal of the water in Units 1,2, and 3. While options are being considered, we do not have anything to share with you at this time.

What time constraints are you working under for delivery of some possible options?

Steve Baker

From: Shaffer, Mark R [mailto:ShafferMr@state.gov]
Sent: Tuesday, March 29, 2011 5:26 AM
To: LIA02 Hoc; LIA03 Hoc
Cc: Schwartzman, Jennifer
Subject: Plan for removal of water from basement(s)

Ambassador is looking for any information regarding "the plan" for removal of water from the basements in Unit 1, 2 and 3. All the reports we are getting (including the one I get from NRC) only says Japan is working on it, but there are difficulties (trenches are full, adding concrete blocks and sandbags, etc.)? Surely there is a specific game plan that has been devised, or is being devised to deal with this situation. Can you please share this with me so I can provide to folks over here. Thanks!

This email is UNCLASSIFIED.

From: Shaffer, Mark R <ShafferMr@state.gov>
Sent: Wednesday, March 30, 2011 6:35 AM
To: LIA02 Hoc; LIA03 Hoc
Cc: Schwartzman, Jennifer; Caldwell, Robert
Subject: RE: Plan for removal of water from basement(s)

Thanks a lot, this is very helpful

This email is UNCLASSIFIED.

From: LIA02 Hoc [mailto:LIA02.Hoc@nrc.gov]
Sent: Wednesday, March 30, 2011 10:39 AM
To: Shaffer, Mark R; LIA03 Hoc
Cc: Schwartzman, Jennifer; Caldwell, Robert
Subject: RE: Plan for removal of water from basement(s)

Mark:

In response to your inquiry, Bob just reported back from the RST. The Site team in Japan reports that the current plan is to pump the basement water to the available hotwells and other tanks onsite. Additionally, US forces in Japan are expected to supply bladders and other additional temporary storage.

Longer term plans are being considered in the US such as temporary rad waste processing skids, temporary holding tanks and tanker trucks. DOE is also investigating whether there is a technology to absorb contaminated materials from water.

LIA02 (Steve Baker)

From: Shaffer, Mark R [mailto:ShafferMr@state.gov]
Sent: Wednesday, March 30, 2011 1:32 AM
To: Shaffer, Mark R; LIA03 Hoc; LIA02 Hoc
Cc: Schwartzman, Jennifer; Caldwell, Robert
Subject: RE: Plan for removal of water from basement(s)

Still no answer? I meet again with the Ambassador to discuss this in a couple of hours. I'm not looking for detailed drawings and flow charts, I just need a brief overview of what the plan(s) are to remove the water. At the very least I need the "various options that are being considered," as mentioned in your note below." Thank you.

This email is UNCLASSIFIED.

From: Shaffer, Mark R
Sent: Tuesday, March 29, 2011 6:41 PM
To: 'LIA03 Hoc'; LIA02 Hoc
Cc: Schwartzman, Jennifer
Subject: RE: Plan for removal of water from basement(s)

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This email is UNCLASSIFIED.

From: LIA03 Hoc [mailto:LIA03.Hoc@nrc.gov]
Sent: Tuesday, March 29, 2011 12:20 PM
To: Shaffer, Mark R; LIA02 Hoc
Cc: Schwartzman, Jennifer; LIA03 Hoc
Subject: RE: Plan for removal of water from basement(s)

Mark:

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Steve Baker

From: Shaffer, Mark R [mailto:ShafferMr@state.gov]
Sent: Tuesday, March 29, 2011 5:26 AM
To: LIA02 Hoc; LIA03 Hoc
Cc: Schwartzman, Jennifer
Subject: Plan for removal of water from basement(s)

Ambassador is looking for any information regarding "the plan" for removal of water from the basements in Unit 1, 2 and 3. All the reports we are getting (including the one I get from NRC) only says Japan is working on it, but there are difficulties (trenches are full, adding concrete blocks and sandbags, etc.)? Surely there is a specific game plan that has been devised, or is being devised to deal with this situation. Can you please share this with me so I can provide to folks over here. Thanks!

This email is UNCLASSIFIED.

From: LIA05 Hoc
Sent: Thursday, March 31, 2011 10:26 AM
To: Dan Feighert; Andrew Seward; Harry Sherwood; John Simpson; Lisa Hamilton; Michelle Ralston; Rebecca Fontenot; Steve Horwitz; Tim Greten; Vanessa E. Quinn
Subject: Emailing: ML110890814
Attachments: ML110890814.pdf

NRC news release



NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION

Office of Public Affairs, Region II
245 Peachtree Center Ave., NE, Suite 1200

Atlanta, GA 30303-1257

Site: www.nrc.gov

Blog: <http://public-blog.nrc-gateway.gov>

No. II-11-014

March 30, 2011

CONTACT: Roger Hannah (404) 997-4417

E-mail: OPA2@nrc.gov

Joey Ledford (404) 997-4416

NRC TO DISCUSS NFS PERFORMANCE AT PUBLIC MEETING IN ERWIN

Nuclear Regulatory Commission officials will meet with management of Nuclear Fuel Services in Erwin, Tenn., on Thursday, April 7 to discuss the results of a licensee performance review for the company's nuclear fuel facility in Erwin.

The meeting will be held at 6:30 p.m. in the Circuit Court Room on the second floor of the Unicoi County Courthouse, 100 Main St. in Erwin. The meeting will be open to members of the public and the news media. NRC officials will open the meeting with a brief presentation on the company's performance, and then be available to answer questions about NRC oversight and inspection of the facility.

The NRC staff assessed performance at NFS during a period beginning Jan. 7, 2010, and ending Dec. 31, 2010, in the areas of safety operations, radiological controls, facility support and special topics, and those evaluations will form the basis of the meeting discussion. The area of safeguards was also assessed, but that area will not be discussed publicly due to the sensitive nature of the information. The NRC staff review determined that NFS continued to conduct its activities safely and securely, protecting the public, workers and the environment.

"We found that NFS is operating the facility safely, but the NRC identified two areas needing continued focus and improvement," said NRC Region II Administrator Victor McCree. "This meeting allows us to discuss those areas and overall safety performance with company officials and interested people in the area."

Based on NRC inspections in 2010, the agency found that NFS improved performance but corrective actions to address the underlying causes of some operational issues have not been fully effective and the area of safety operations continues to need improvement.

In addition, NRC inspectors found that additional effort by NFS management is needed to improve oversight of facility operations.

At the start of the current review period, the NRC issued a Confirmatory Action Letter that required the facility to remain shut down until some improvements outlined in the letter were put into place and evaluated by NRC inspectors. Several of the facility's process lines were restarted in 2010 after the NRC concluded that actions taken by NFS were sufficient to provide reasonable assurance that they could be operated safely.

In 2011, the NRC will augment its normal inspections at NFS with additional inspections to ensure that actions taken by the company are effective and sustainable. These inspections include an assessment of readiness to restart the uranium hexafluoride process line, follow-up inspections for both the confirmatory action letter and an order issued to the facility, a problem identification and resolution inspection, and a design review inspection.

A copy of the NRC letter detailing the NFS review is available online in the NRC's Agency-wide Document Access and Management System at www.nrc.gov/reading-rm/adams/web-based.html. The ML number is ML110660633.

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News releases are available through a free *listserv* subscription at the following Web address: <http://www.nrc.gov/public-involve/listserver.html>. The NRC homepage at www.nrc.gov also offers a SUBSCRIBE link. E-mail notifications are sent to subscribers when news releases are posted to NRC's website.

From: LIA07 Hoc
Sent: Thursday, March 31, 2011 10:27 PM
To: Borchardt, Bill; Bradford, Anna; Cohen, Shari; Collins, Elmo; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Jaczko, Gregory; Johnson, Michael; Leeds, Eric; Loyd, Susan; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walker, Dwight; Walls, Lorena; Weber, Michael
Subject: March 31, 2011 22:00 "One Pager"
Attachments: March 31 1500 EDT one pager.docx; March 31 2200 EDT one pager.docx

Attached, please find the 2200 EDT March 31 one pager.
-Sara

KKKK-126

From: LIA02 Hoc
Sent: Thursday, March 31, 2011 10:21 AM
To: Abrams, Charlotte; LIA03 Hoc
Cc: Coates, Carlotta
Subject: RE: traveler checklist
Attachments: Travel to Japan Checklist-UPDATED!.docx

Hi Carlotta – Here is our current checklist. Please make your addition and send it back to me when you can, and I will then send it off to the new travelers leaving on Saturday.

Lauren

From: Abrams, Charlotte
Sent: Thursday, March 31, 2011 10:00 AM
To: LIA02 Hoc; LIA03 Hoc
Cc: Coates, Carlotta
Subject: traveler checklist

We need to add something to the traveler checklist for Japan. I just talked with Carlotta and we need to have the traveler look at the travel training before they go. Carlotta can provide the exact wording for the checklist.

International Travel Checklist

Pre-Travel Activities	
	Completed
1. Passport: Make sure either personal or official passport is valid for at least 6 months after the date of completion of the trip, if you're traveling with USAID, a visa is not required. Contact Steve Dembek if you need assistance 301-415-2342	
2. Ascertain any health immunization recommendations: Contact the NRC Health Unit (415-8400) to consult on possible medical issues and precautions, including the possibility of getting recommended inoculations or other medications and educational materials. Travelers can check recommended immunizations and other health advisories at http://www.cdc.gov/travel/ .	
3. Obtain international Blackberry – Contact Karen Jackson at 415-6398	
4. Country clearance cable information Format: Format is available at OIP SharePoint (http://portal.nrc.gov/OCM/ip/travel/default.aspx) Complete the requested items. Place of Birth should be exactly the same as shown in your passport. Include your security clearance information and follow the directions included.	
5. Obtain dosimetry and KI tablets. In order to get dosimeter, traveler needs to contact a Radiation Safety Officer. Contact Undine Shoop at 301-415-2063 or your Regional RSO.	
6. USAID Needs the following information (send to: RMTPACTSU_ELNRC@ofda.gov, or phone: (202) 236-6417, 202-712-4383): For anyone deploying to Japan we (the NRC USAID reps will need the following): Full Name Home Address SSN Passport # Date and Place of Birth Issue Date of Passport Expiration Date of Passport Place of Passport Issuance Finally, since the Travel Authority will be USAID we need the following Banking information: Account Name Account Number Routing Number	

7. Receive Cultural Briefing by OIP – Contact Nader Mamish 301-415-3244 to arrange.	
8. Recommend contact with EAP – Available 27/7 at 1-800-869-0276	
9. Recommended Business Attire – Normal attire in Japan is business and ties are worn all the time. Higher end business casual would also be acceptable in some situations.	
10. Business cards – Contact your office secretary.	

From: Abrams, Charlotte
Sent: Thursday, March 31, 2011 10:00 AM
To: LIA02 Hoc; LIA03 Hoc
Cc: Coates, Carlotta
Subject: traveler checklist

We need to add something to the traveler checklist for Japan. I just talked with Carlotta and we need to have the traveler look at the travel training before they go. Carlotta can provide the exact wording for the checklist.

From: LIA02 Hoc
Sent: Thursday, March 31, 2011 7:25 PM
To: LIA07 Hoc
Cc: LIA03 Hoc
Subject: FYI: TEPCO Earthquake Information Update on March 31: Fukushima Daiichi/Fukushima Daini Status
Attachments: image001.jpg

From: Hidehiko Yamachika [mailto:yamachika-hidehiko@jnes-usa.org]
Sent: Thursday, March 31, 2011 7:22 PM
To: LIA02 Hoc
Cc: aono-kenjiro@jnes-usa.org; Michael W. Chinworth
Subject: FW: TEPCO Earthquake Information Update on March 31: Fukushima Daiichi/Fukushima Daini Status

FYI

This id from TEPCO Washington.

From: 松尾 建次 [mailto:matsuo.kenji@wash.tepco.com] **On Behalf Of** matsuo.kenji@tepco.co.jp
Sent: Thursday, March 31, 2011 5:38 PM
To: matsuo.kenji@tepco.co.jp
Subject: TEPCO Earthquake Information Update on March 31: Fukushima Daiichi/Fukushima Daini Status

Dear Friends,

Here are updates on March 31 at Fukushima Daiichi and Fukushima Daini NPS

- (1) Status of Fukushima Daiichi NPS as of March 31.
- (2) Detection of radioactive materials in the ground water at Fukushima Daiichi NPS
- (3) A campaign truck unlawfully entered the Fukushima-Daini NPS.
- (4) Photos at Fukushima Daiichi NPS: We have photos at Fukushima Daiichi NPS on the web. You may use these photos, but please put a note to indicate source as "Tokyo Electric Power Company".
<http://www.tepco.co.jp/en/news/110311/index-e.html>

Contacts:

TEPCO Washington Office :202-457-0790

Kenji Matsuo, Director and General Manager

KKKK-129

(1) Status of Fukushima-Daiichi NPS as of March 31

<Water drainage from underground floor of turbine buildings>

- Units 1,2,3: Plan to transfer to the condenser (hotwell).
- Unit 4: Under consideration.

	Underground floor of turbine building	Condenser (hotwell)	Condensate Water Tank
【Unit 1】	3/29 Suspend transfer to the condenser	Full	3/31 12:00~ Started water transfer to SP surge tank
【Unit 2】	Waiting for transfer to the condenser	Full	3/29~ Transfer to SP surge tank in progress
【Unit 3】	Waiting for transfer to the condenser	Full	3/31 8:37 Completed transfer to SP surge tank

SP: Suppression Pool

<Status of water in trenches>

【Unit 1】 (Surface dose:0.4mSv/h)

- 3/31 9:20~11:25 Water transfer to waste reserve tank at Rad Waste Treatment Facility, led water surface down 1m.

【Unit 2】 (Surface dose: over 1000mSv/h) : Water treatment measure under consideration

【Unit 3】 (Surface dose: N/A due to rubbles) : Water treatment measure under consideration

【Unit 4】 (Surface dose:0.5mSv/h) : Water treatment measure under consideration

<Radioactive material Monitoring>

- Seawater

【1-4u Water discharge Canal South 330m】

- Sample obtained at 13:55, 3/29 → I-131: 130 Bq/cm³
- Sample obtained at 8:20, 3/30 → I-131: 32 Bq/cm³
- Sample obtained at 13:55, 3/30 → I-131: 180 Bq/cm³

【5~6u Water discharge Canal North 30m】

- Sample obtained at 14:10, 3/29 → I-131: 51 Bq/cm³
- Sample obtained at 8:40, 3/30 → I-131: 57 Bq/cm³
- Sample obtained at 14:15, 3/30 → I-131: 47 Bq/cm³

- Other development

3/30~ Started monitoring within a radius of 20km

3/30 Conduct sampling survey of underground water

<Water Injection to Spent Fuel Pool>

- 3/31 Result

【Unit 1】 13:03～ Started fresh water injection by a concrete pump vehicle, then suspended injection.
14:29～16:04 Resumed fresh water injection.

- 3/31 Plan

【Unit 3】 Fresh water injection by a concrete pump vehicle.

<Water Injection to Reactor Vessel>

【Unit 1】 Fresh water injection on going

RPV Temperature 3/31 12:00 〈Feed water nozzle〉 246.1C 〈RPV Bottom〉 126.1C

【Unit 2】 Fresh water injection on going

RPV Temperature 3/31 12:00 〈Feed water nozzle〉 172.4C

【Unit 3】 Fresh water injection on going. No change.

【Unit 4】 N/A

【Units 5/6】 Cold Shutdown. No change.

【Common Fuel Pool】 No change.

<Power Supply>

【Units 1/2】 3/31 Units 1/2 Common DC 125V Power Panel Access to Electricity

【Units 3/4】 3/30 Unit 3 DC 125V Power Panel(B) Access to Electricity. Battery charging

【Units 1～6】 Equipment integrity confirmation on going

<Other>

Postponed test dispersal of antiscattering agents due to bad condition by rain fall the day before.

(2) Detection of radioactive materials in the ground water at Fukushima Daiichi NPS

On March 28th, TEPCO received advice from Nuclear Safety Commission of Japan to conduct sampling survey of the water on the first basement of turbine building (= ground water) at Fukushima Daiichi NPS as well as to reinforce the sampling survey of seawater in order to secure safety and to monitor the leakage of the water on the basement into underground and/ or sea.

On March 30th, TEPCO conducted nuclide analysis of radioactive materials, the sample of which was collected from the water on 1st basement (sub drain) of turbine building at Fukushima Daiichi NPS. Radioactive materials were detected as shown in the table bellow. TEPCO reported the result to Nuclear and Industry Safety Agency as well as to the government of Fukushima Prefecture on March 31.

Fukushima Daiichi Nuclear Power Station: the result of measurement of sub drain

		(Bq/cm ³)				
		Unit 1 (collected at 11:10 am, on March 30 th)	Unit 2 (collected at 11:20 am, March 30 th)	Unit 3 (collected at 11:30 am, March 30 th)	Unit 5 (collected at 10:30 am, March 30 th)	Unit 6 (collected at 10:40 am, March 30 th)
Hb-95	(About 35 days)	Below the detection limit	About 3.6×10^{-2}	Below the detection limit	Below the detection limit	Below the detection limit
Te-129	(About 70 minutes)	About 1.2×10^3	Below the detection limit	Below the detection limit	Below the detection limit	About 8.1×10^1
Te-128m	(About 34 days)	About 8.7×10^0	About 1.7×10^0	Below the detection limit	Below the detection limit	About 1.3×10^0
I-131	(About 8 days)	About 4.3×10^2	About 8.0×10^1	About 2.2×10^1	About 1.6×10^0	About 2.0×10^1
I-132	(About 2 hours)	About 8.3×10^0	Below the detection limit	About 1.3×10^1	Below the detection limit	About 5.8×10^{-1}
Te-132	(About 3 days)	About 3.0×10^0	About 3.9×10^{-1}	About 5.4×10^{-1}	About 1.0×10^{-1}	About 6.0×10^{-1}
Cs-134	(About 2 years)	About 5.2×10^0	About 7.0×10^{-1}	About 1.0×10^1	About 2.5×10^{-1}	About 4.7×10^0
Cs-136	(About 13 days)	About 3.9×10^{-1}	About 6.5×10^{-2}	About 9.4×10^{-1}	About 2.7×10^{-2}	About 3.8×10^{-1}
Cs-137	(About 30 years)	About 5.9×10^0	About 6.3×10^{-1}	About 1.0×10^1	About 2.7×10^{-1}	About 4.9×10^0
La-140	(About 2 days)	About 3.3×10^{-1}	Below the detection limit	About 7.3×10^{-2}	Below the detection limit	About 4.1×10^{-2}

<Comments>

- Sub-drain is designed to drain groundwater in order to prevent the buildings from floating by the buoyancy of groundwater.
- TEPCO is planning to constantly take samples, about once a week.
- We have not found out any significant change (decrease) of the level of the water trapped in the turbine buildings (water puddle) but we will continuously monitor it. So far, no significant changes of the puddle level in the turbine buildings are confirmed.
- We have not monitored the water level of the sub-drain because it is affected by the conditions of the groundwater. However, we have been monitoring the change of the water level of the turbine buildings and plumbing trench shafts.
- We assume that the water containing radioactive materials has leaked into the underground by the precipitating water. It might have been caused by the sprayed water, besides the precipitation.

(3) A campaign truck unlawfully entered the Fukushima-Daini NPS.

A campaigner's sound truck unlawfully entered the site through the west locked car gate around 1:08 pm on March 31. After driving around in the site, the car left through the same gate about 1:20 pm. TEPCO reported this event to the Fukushima Prefecture Police Department. We have shut the gate with TEPCO's vehicles after the campaigner's vehicle left. The intruder was detained by the police and taken away to a decontamination facility.

From: ET07 Hoc
Sent: Thursday, March 31, 2011 3:09 PM
To: Gott, William
Subject: FW:
Attachments: 3 30 11-Barrett1.pdf

From: Wiggins, Jim
Sent: Thursday, March 31, 2011 3:07 PM
To: PMT01 Hoc; ET07 Hoc; RST01 Hoc
Cc: Weber, Michael; Virgilio, Martin
Subject: FW:

As you recall, Lake was a major player in the TMI-2 post-event activities, leading an org onsite in Middletown PA thru to the 90s.....

From: Salley, MarkHenry
Sent: Thursday, March 31, 2011 11:28 AM
To: Wiggins, Jim; Sheron, Brian; Uhle, Jennifer
Subject: FW:

Notice how anyone who went to MIT is coming out of the woodwork on the Fukushima Incident and is an expert?

Also if you rearrange the letters "MIT" you get "TMI".....think about it.....

From: Qualls, Phil
Sent: Thursday, March 31, 2011 9:18 AM
To: Melfi, Jim; Salley, MarkHenry; Gallucci, Ray
Subject: FW:

Interesting photos

From: Sullivan, Kenneth [mailto:ks@bnl.gov]
Sent: Thursday, March 31, 2011 8:14 AM
To: Qualls, Phil
Subject:

fyi

KKKK-130

Energy, Air, Water, & Earth

Nuclear Reactor Accidents:
Three Mile Island & Fukushima

MIT ANES Symposium

March 30, 2011

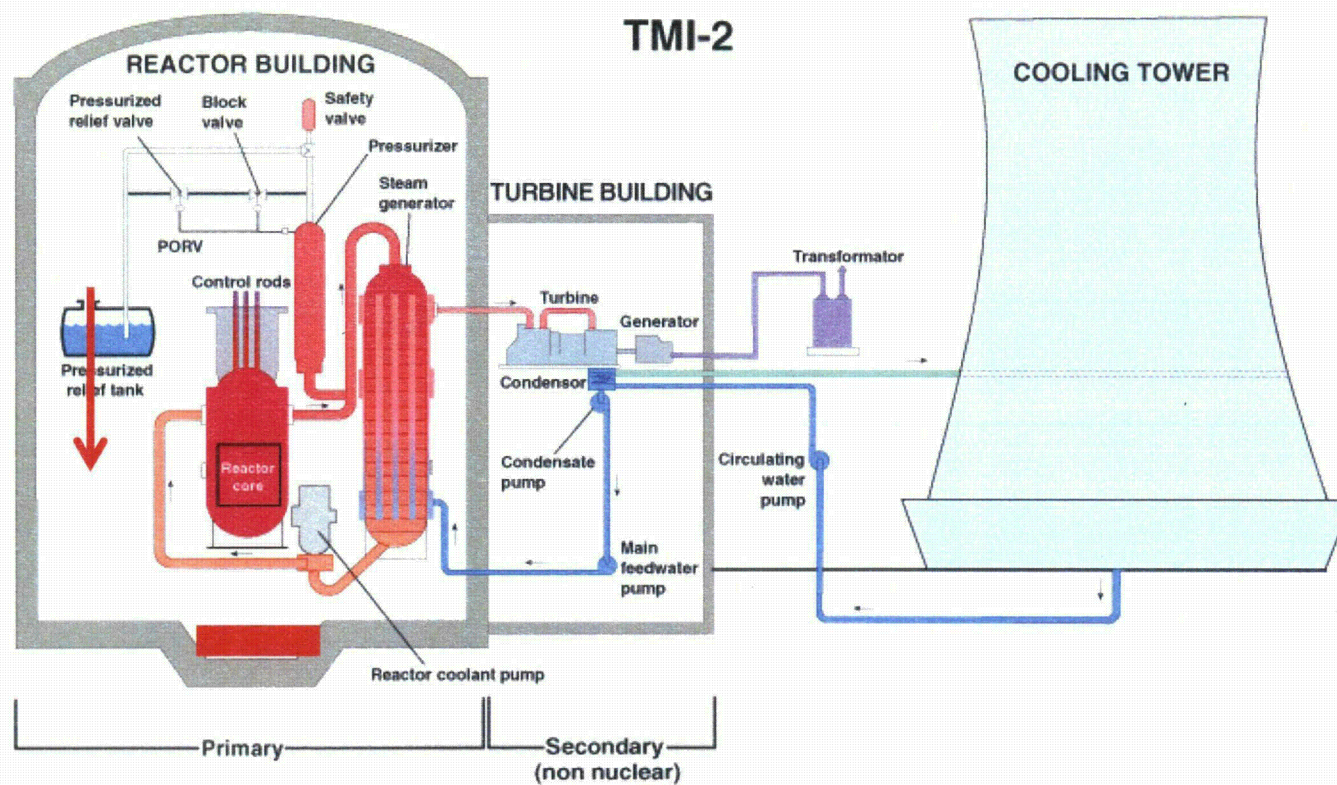
Lake H. Barrett

Rockville, MD

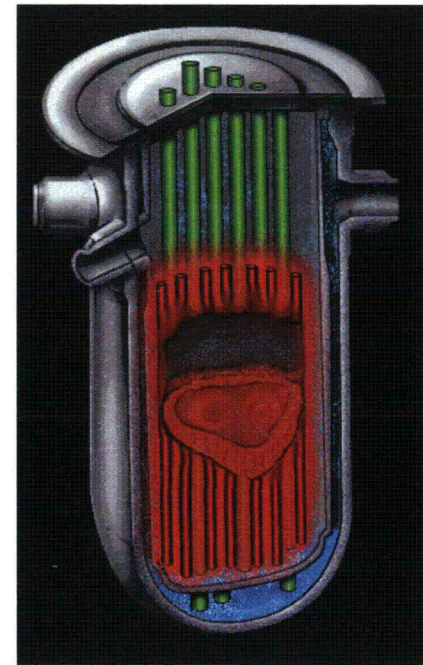
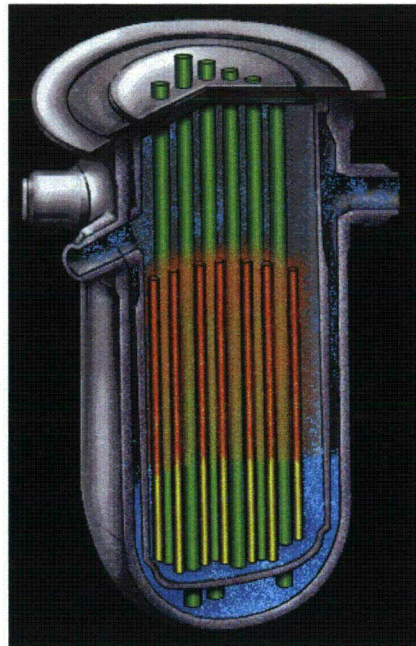
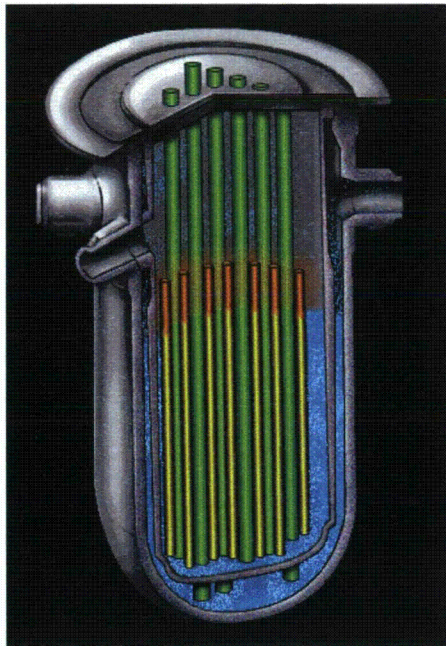
Disclaimer: Fukushima Information is preliminary especially regarding interpretation of events; opinions expressed are mine and mine alone.

Three Mile Island

March 28, 1979

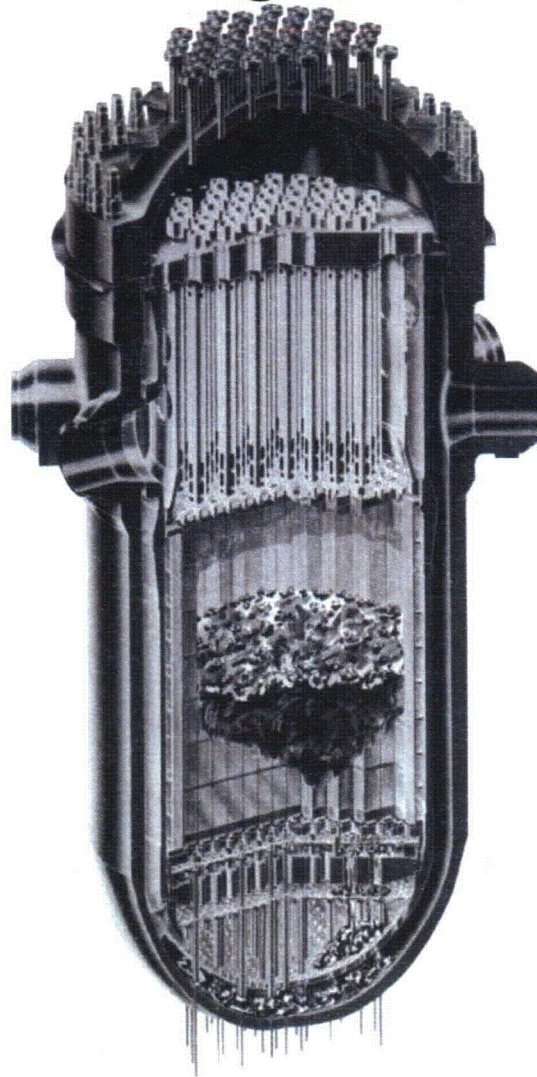


TMI Core Damage Sequence



TMI Core Configuration

~Evening 3/28/1979

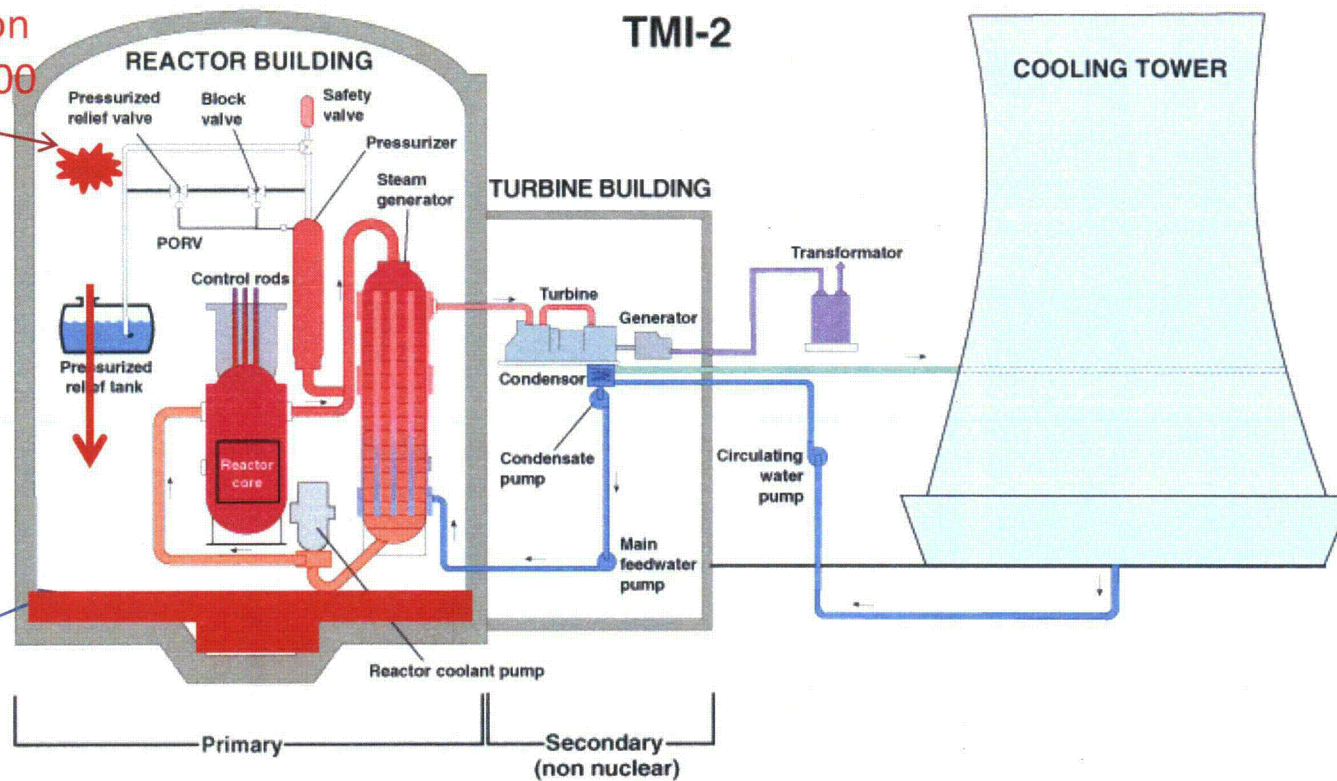


Three Mile Island

March 28, 1979

Hydrogen
Deflagration
28psig 13:00

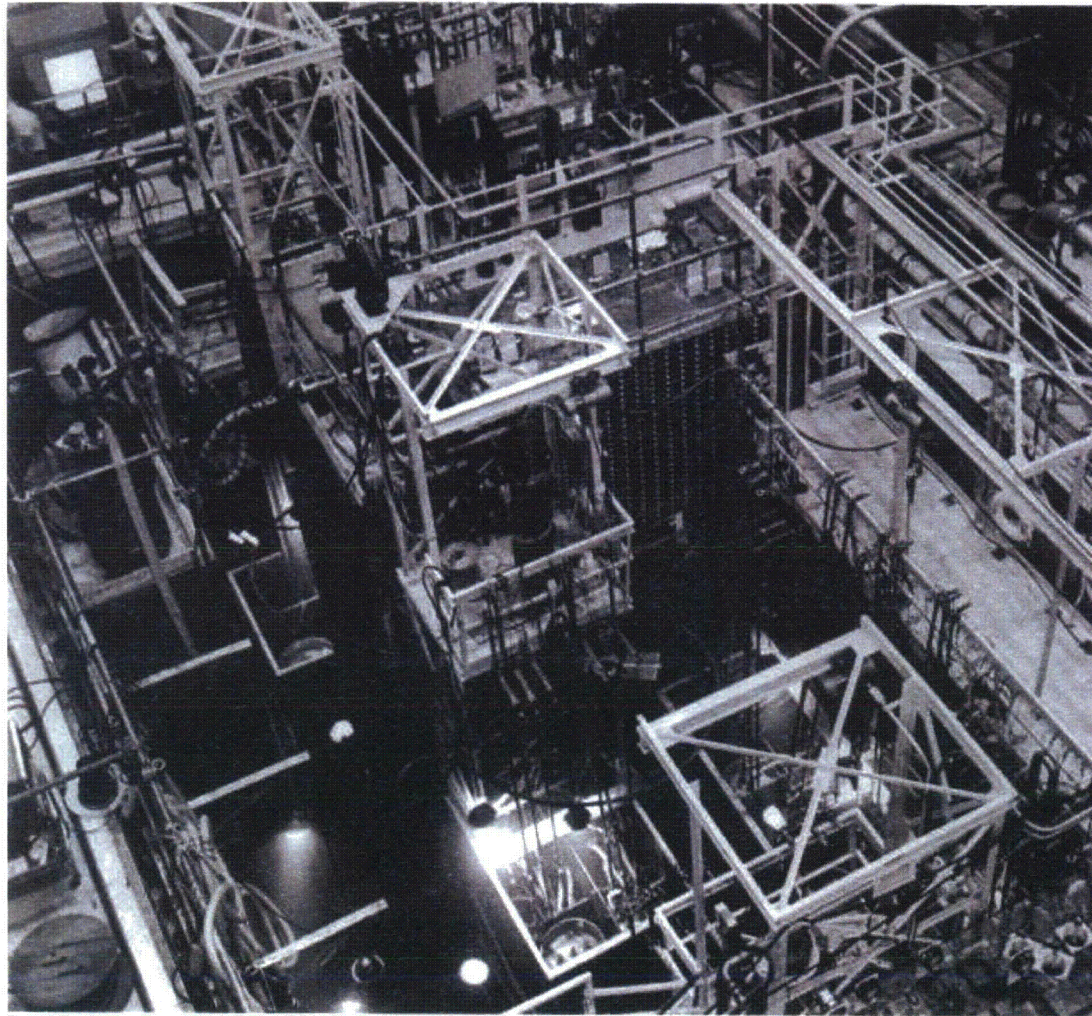
~3M deep
water
1000R/hr
@ 2 yr



Three Mile Island History

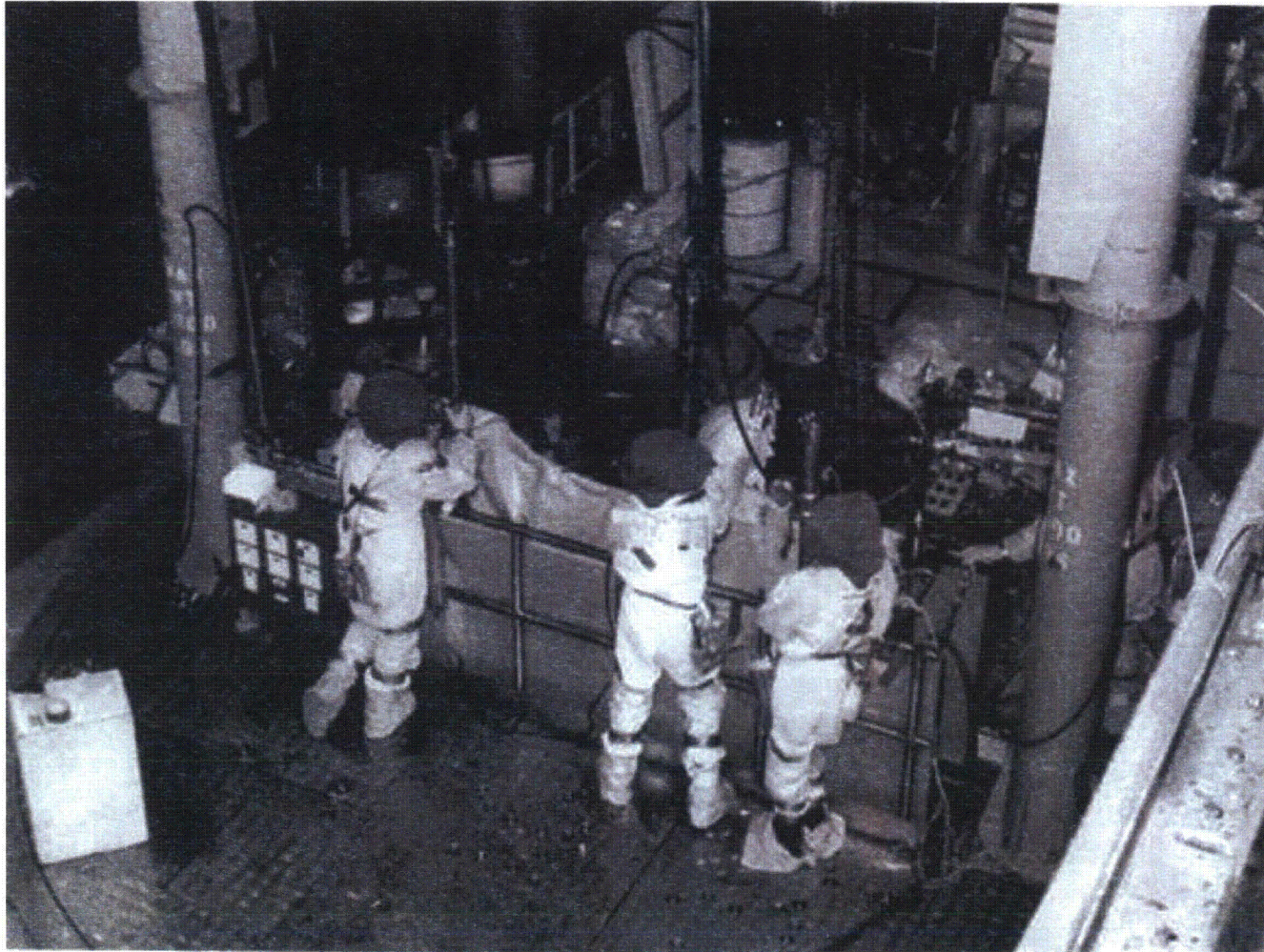
- Reactor Scram: 04:00 3/28/79
- Core melt and relocation: ~ 05:00 – 07:30 3/28/79
- Hydrogen Deflagration: 13:00 3/28/79
- Recirculation Cooling: Late 3/28/79
- Phased Water Processing: 1979-1993
- Containment Venting 43KCi Kr-85: July 1980
- Containment Entry: July 1980
- Reactor Head removed and core melt found: July 1984
- Start Defuel: October 1985
- Shipping Spent Fuel: 1988-1990
- Finish Defuel: Jan 1990
- Evaporate ~2M gallons Processed Water: 1991-93
- Cost: ~\$1 Billion

High Rad Reactor Water Cleanup System Installed in Spent Fuel Pool



TMI Damaged Core Removal

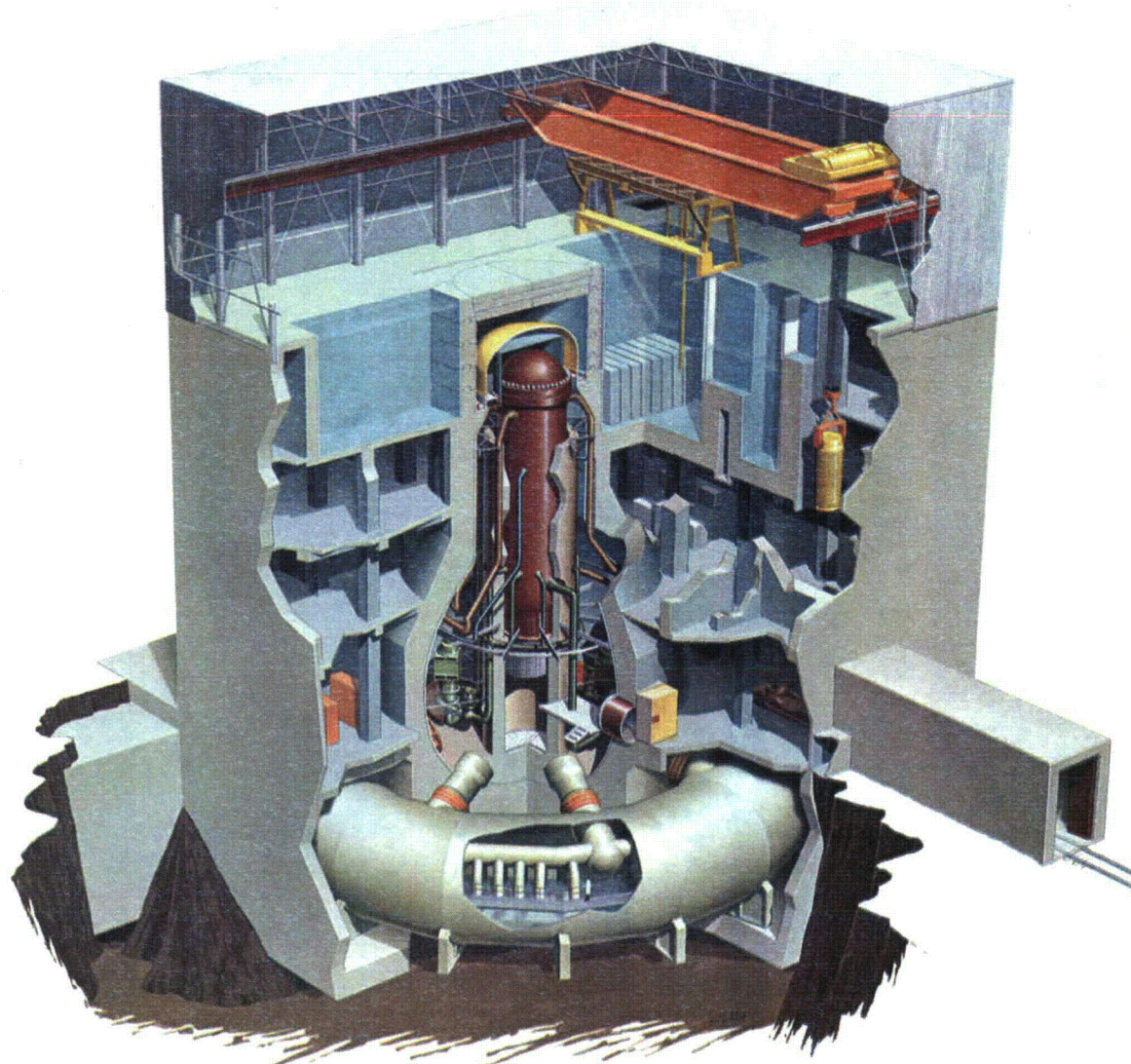
~1985-1990



Fukushima Daiichi Nuclear Power Station

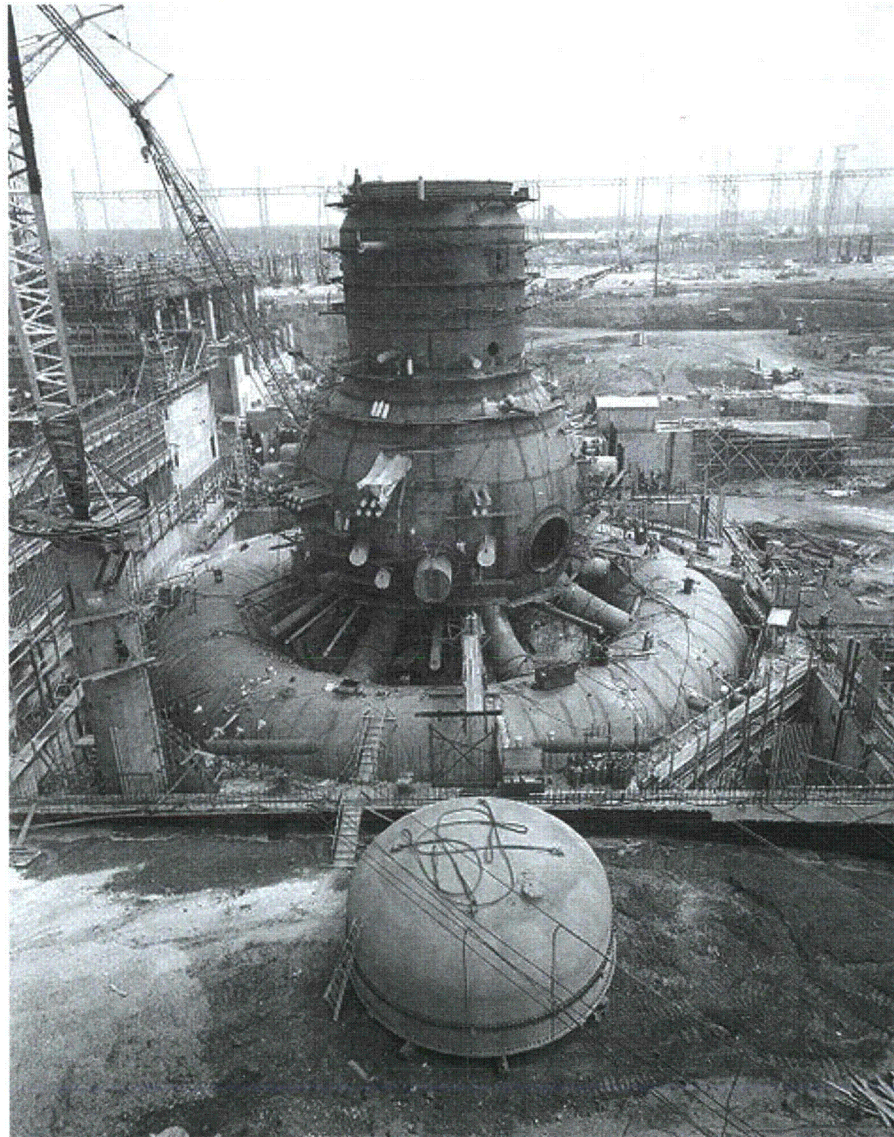


GE Mark 1 Reactor Building



DRYWELL TORUS

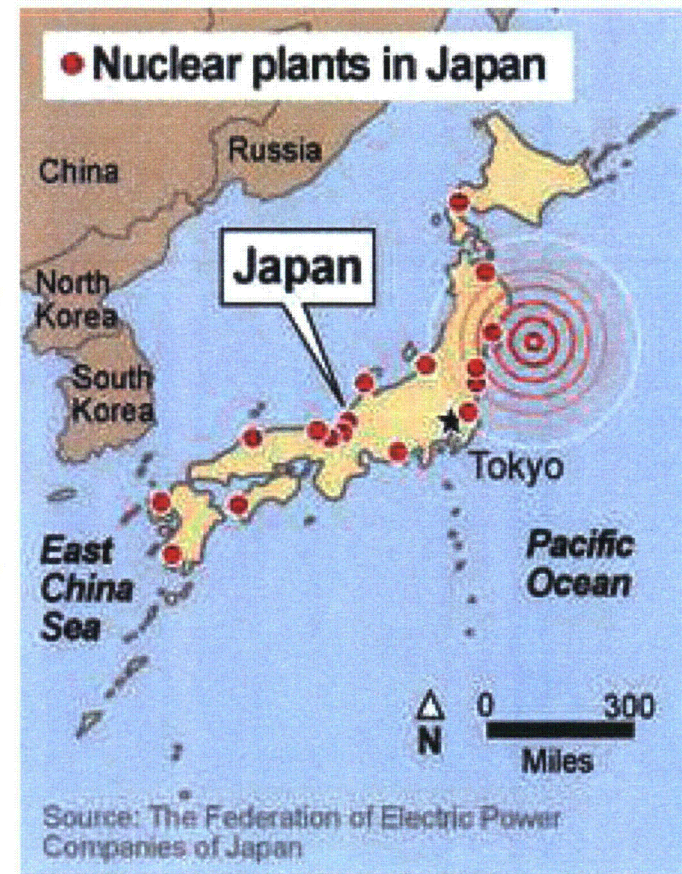
Browns Ferry Primary Containment



Event Initiation

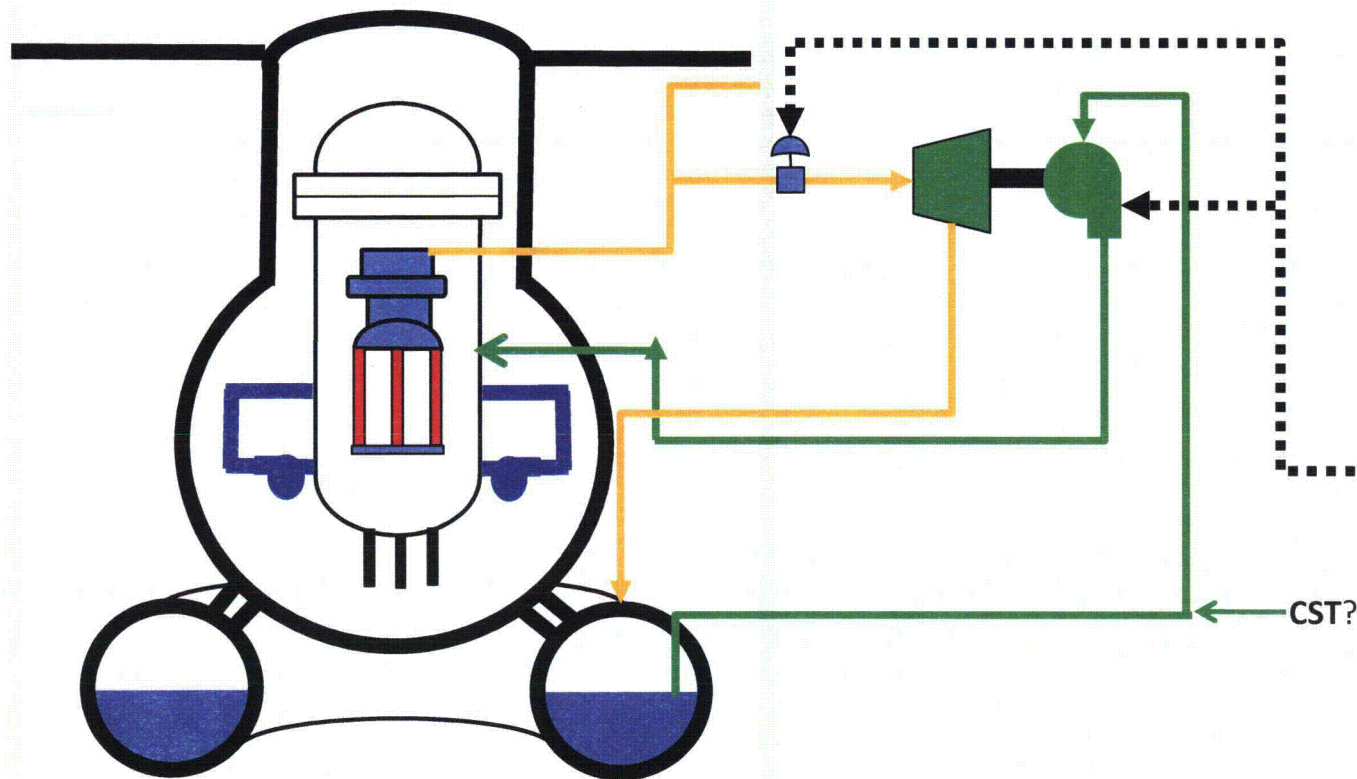
March 11, 2011

- About 14:46, a 9.0 magnitude earthquake struck (Plant design basis earthquake: 8.2)- Plant safety systems reportedly function satisfactorily.
- Units 1,2 & 3 Scram & Unit 4 has 100 day old core offloaded into Unit 4 Spent Fuel Pool
- ~ 15:45, a tsunami 14 meters high inundated the site, whose design basis was 5.7 meters – the reactors and backup diesel power sit roughly 10 to 13 meters above sea level
- The impacts up and down the northeast coast resulted in tragic loss of 10,000+ lives, damage, and destruction of infrastructure.



By Janet Loehrke, USA TODAY

Battery Power Control of Steam-Driven Reactor Core Isolation Cooling System In Units 2 &3 (Unit 1 Had Isolation Condenser which Boiled Dry)

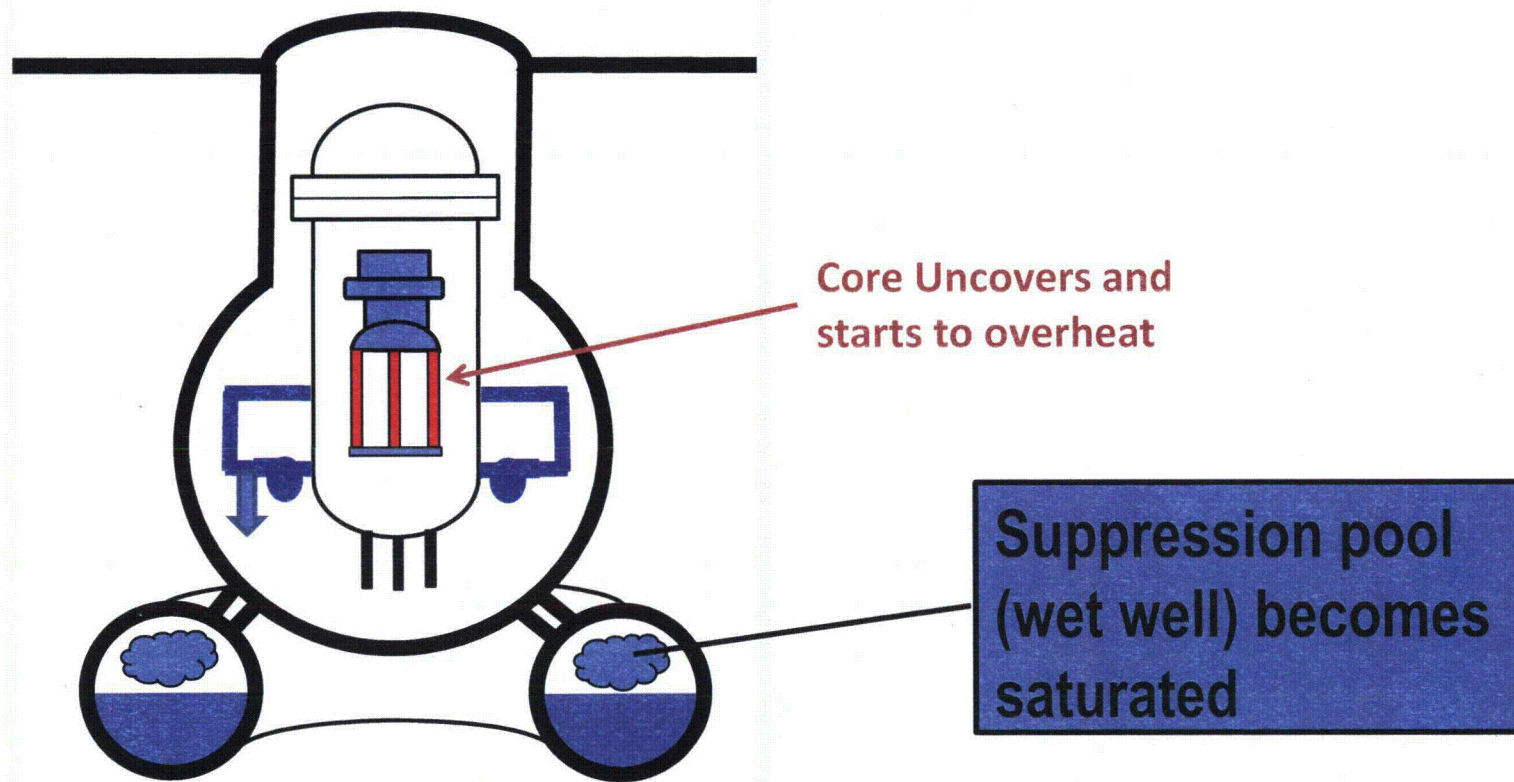


3/11 15:45 JST



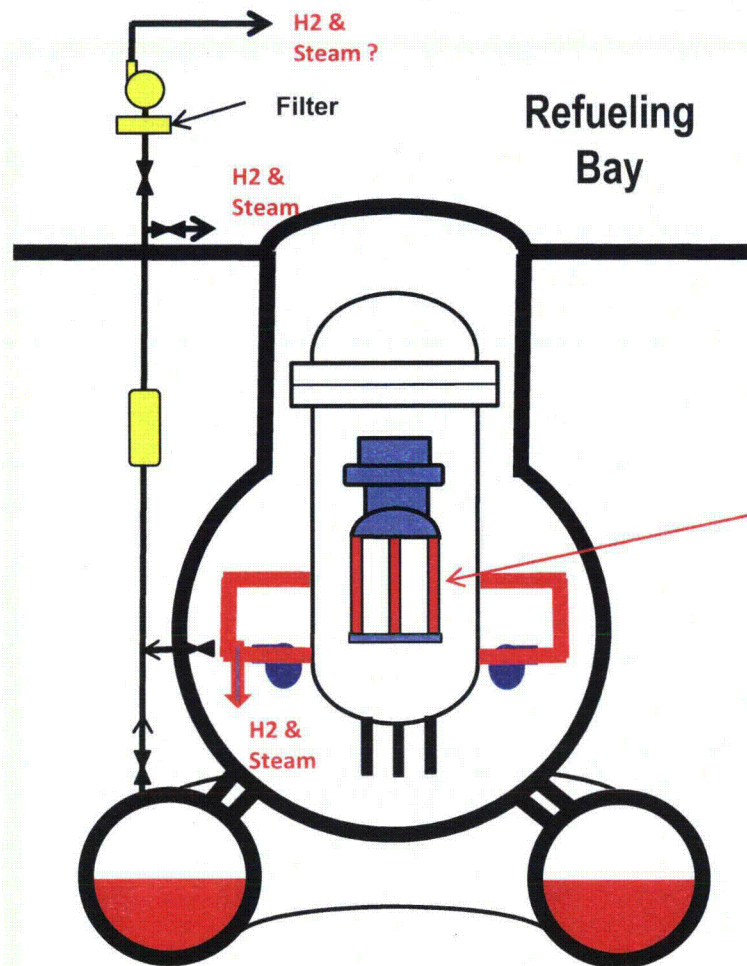
3/11 15:45 to ~ 3/11
24:00 JST

Battery Power Exhausted



3/12 ~02:00 JST

Venting Primary Containment



Core
Overheated

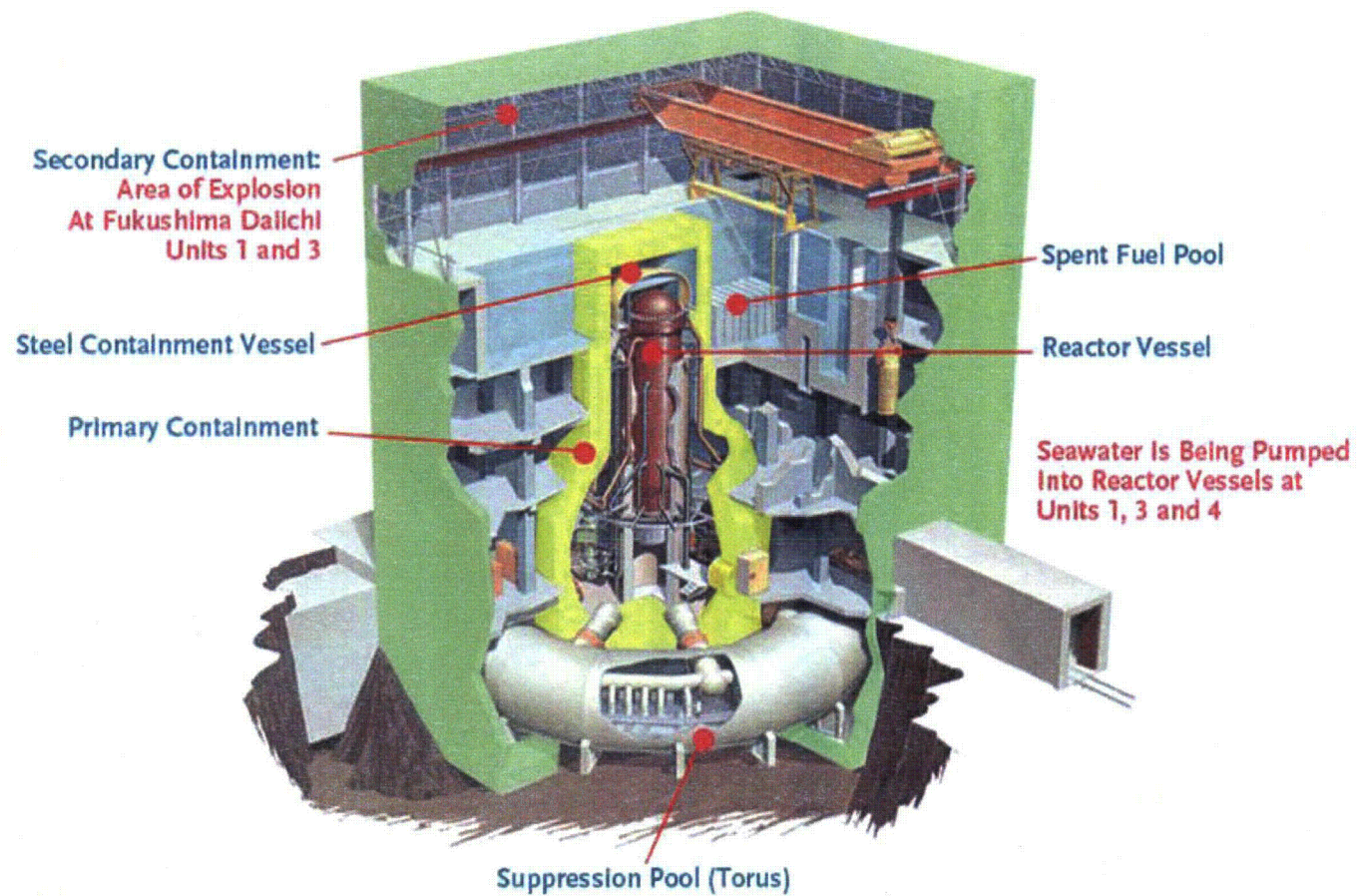
Primary Containment
Pressure ~ 100psi

3/12 ~05:30 U1

3/13 ~ 00:00 U2

3/13 ~ 08:40 U3

BWR Barriers



Unit 1 Explosion 3/12 15:30

Unit 3 Also Explodes 3/14 11:15



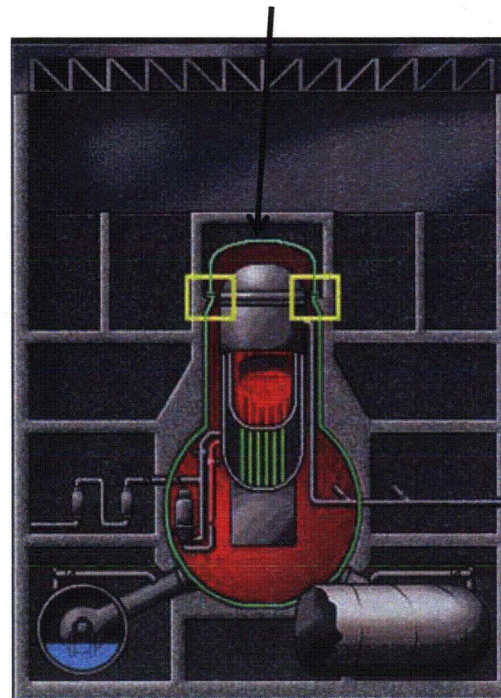
Fukushima: Reactor Vessel-Primary-Secondary Containment Sequence

Primary Coolant System



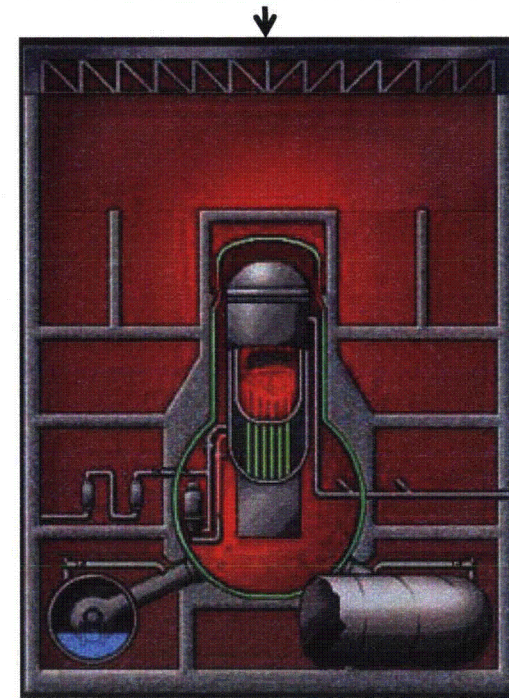
Core Over Heat
-Clad Burst ~900C
-Clad Oxidize ~1200C
-H₂ Release
-Partial Melt~1800C-2700C
-Primary Coolant System Overpressure

Primary Containment



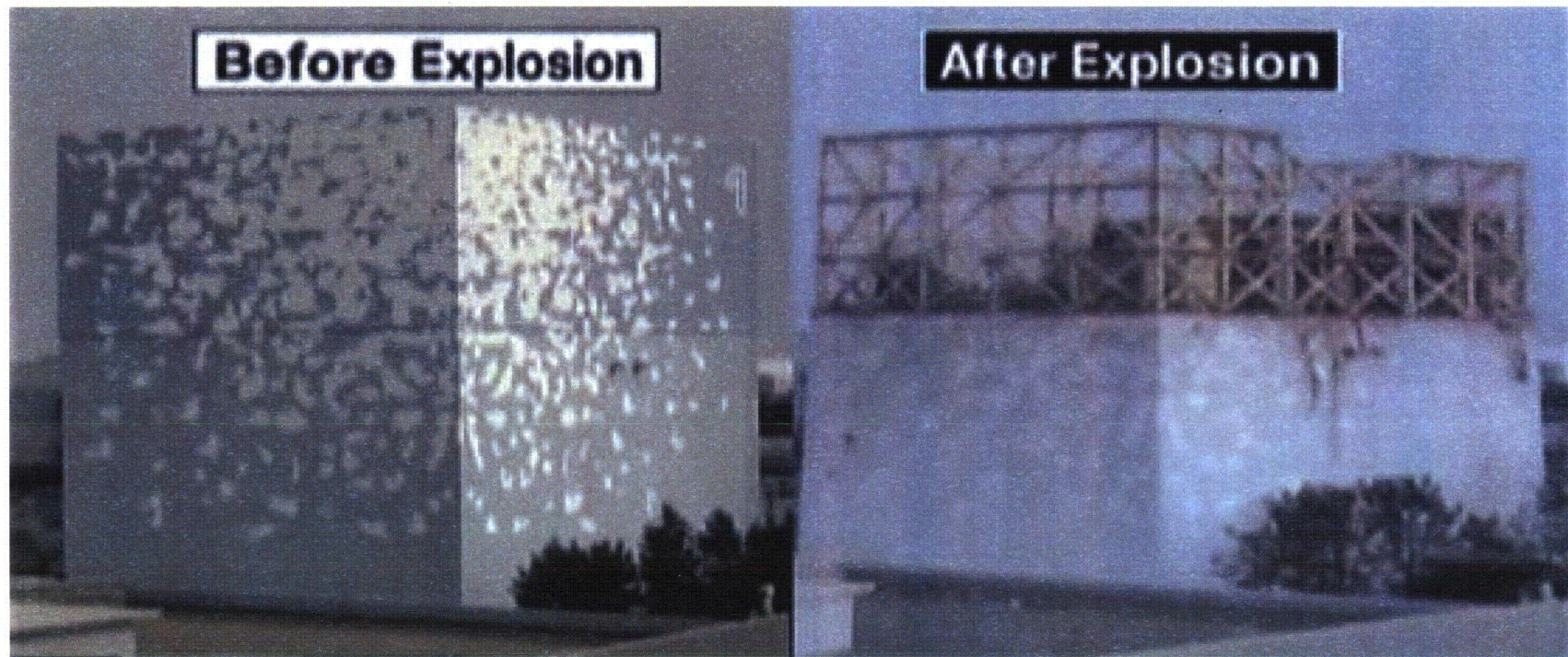
Vent from Primary Coolant Sys to Primary Containment- H₂, Steam, & Fission Products (Xe, Kr, I, Cs etc)

Secondary Containment



No Primary Containment Cooling therefore Primary Containment Overpressure- Vent to Secondary Containment

Unit 1 Reactor Building



Unit 3 Reactor Building

Before



Reuters

After



TEPCO

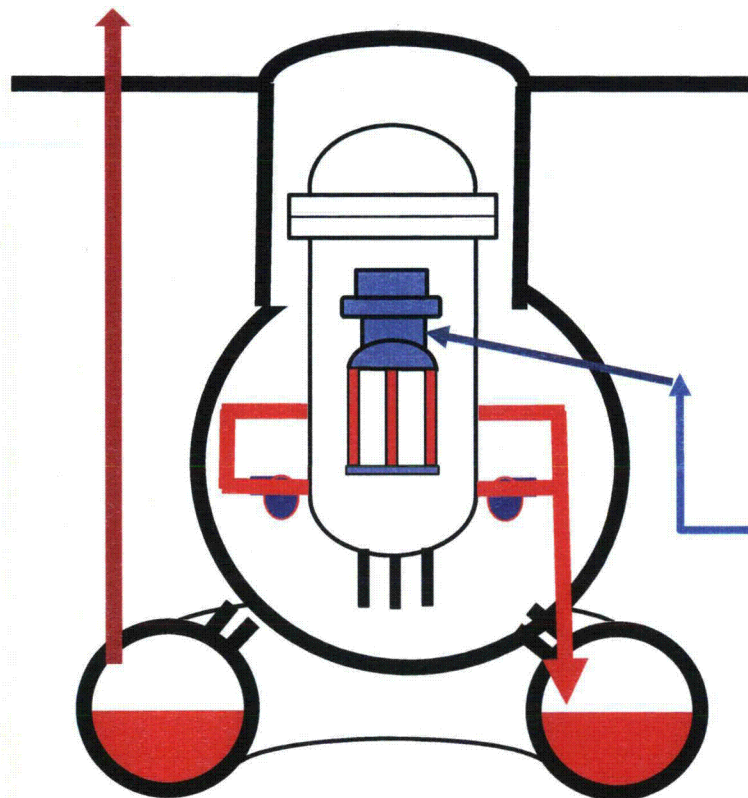
Bleed & Feed Core Cooling Established

Seawater Injection Started Using Fire Engine Pump

Shift to Fresh Water Injection ~3/26-Present: To Dissolve

Vapor Venting

Possible Salt Cakes



Seawater Injection

Start Time Injected to 3/20 15:00

U1 3/12 20:20 3530M3

U3 3/13 13:10 5880M3

U2 3/14 16:30 4389M3

Tank

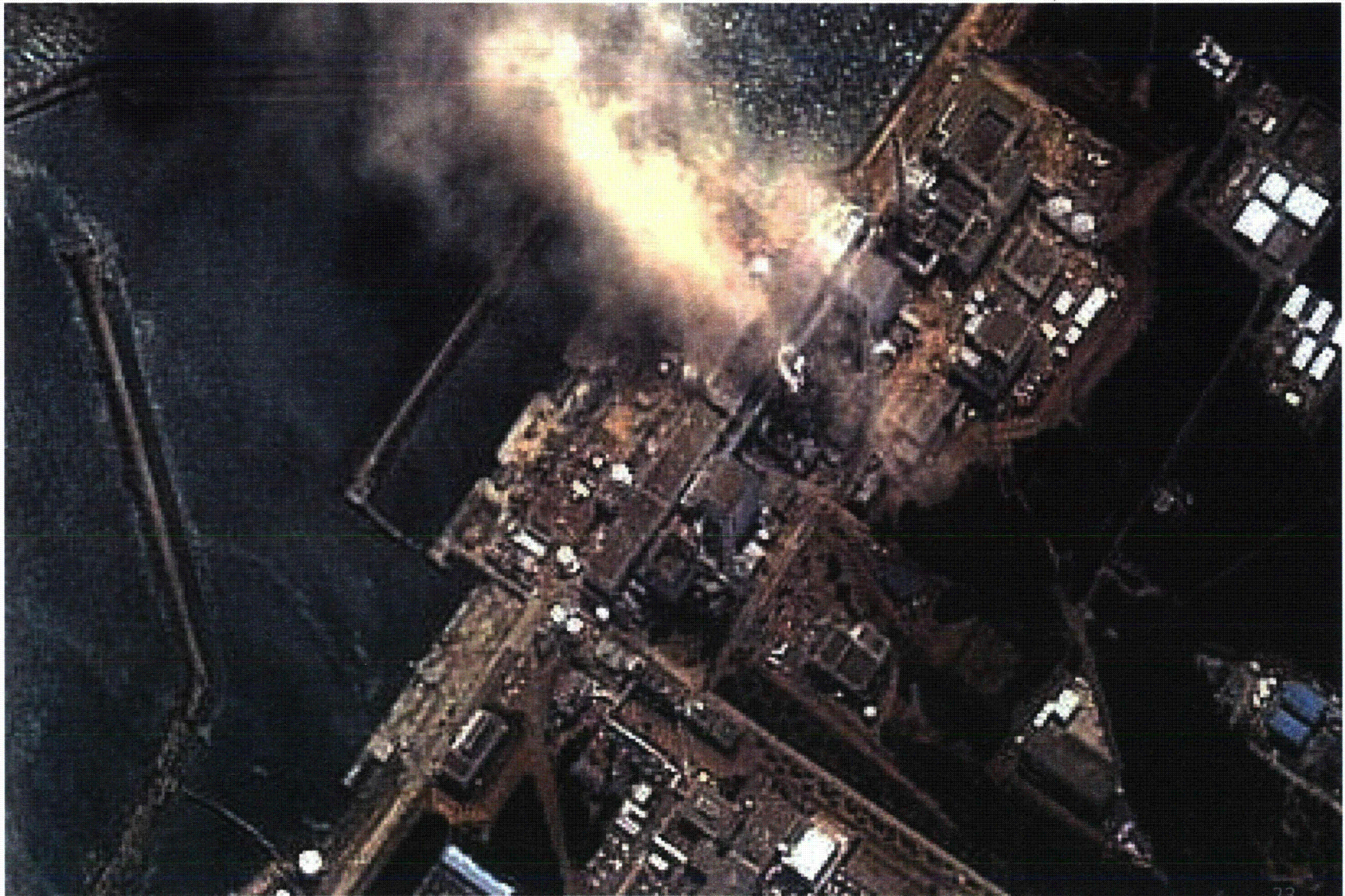
Boric Acid

Immediately After Unit 3 Explosion

3/15/11 ~10:00AM JST



Post Unit 3 & Pre Unit 4 Explosion(s)



Reactor Building Cross Section

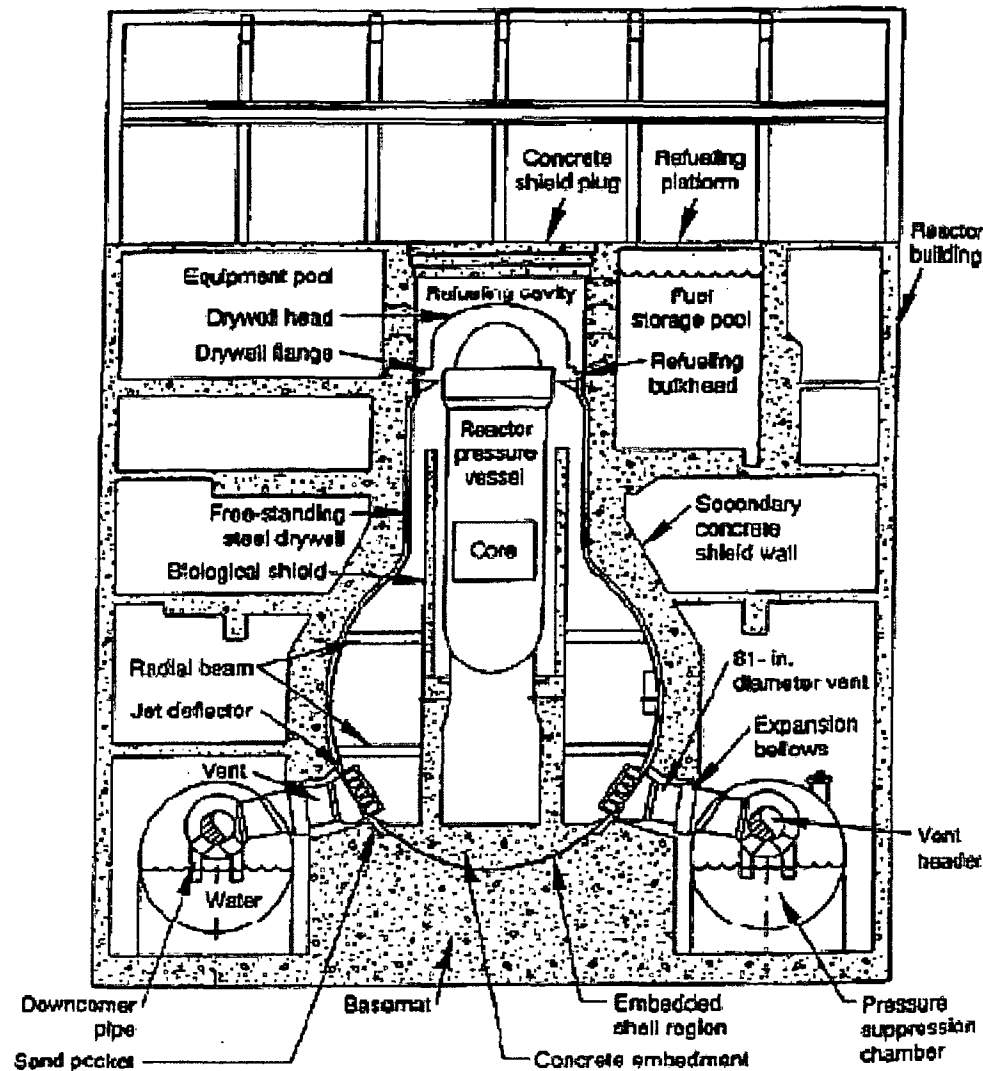
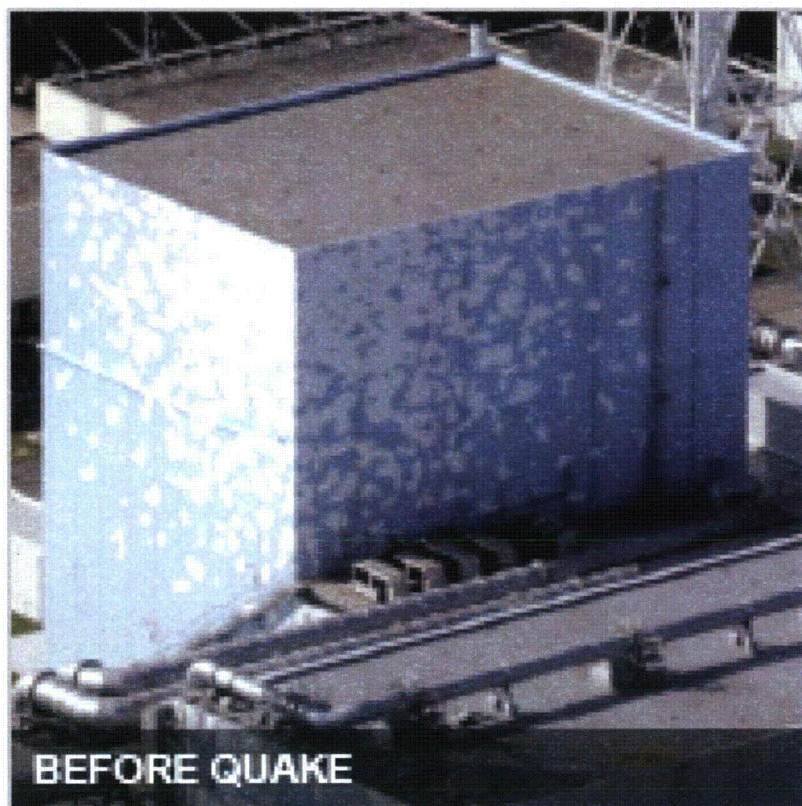


Figure 20. Mark I General Electric, GE BWR Containment.

Unit 4 Reactor Building

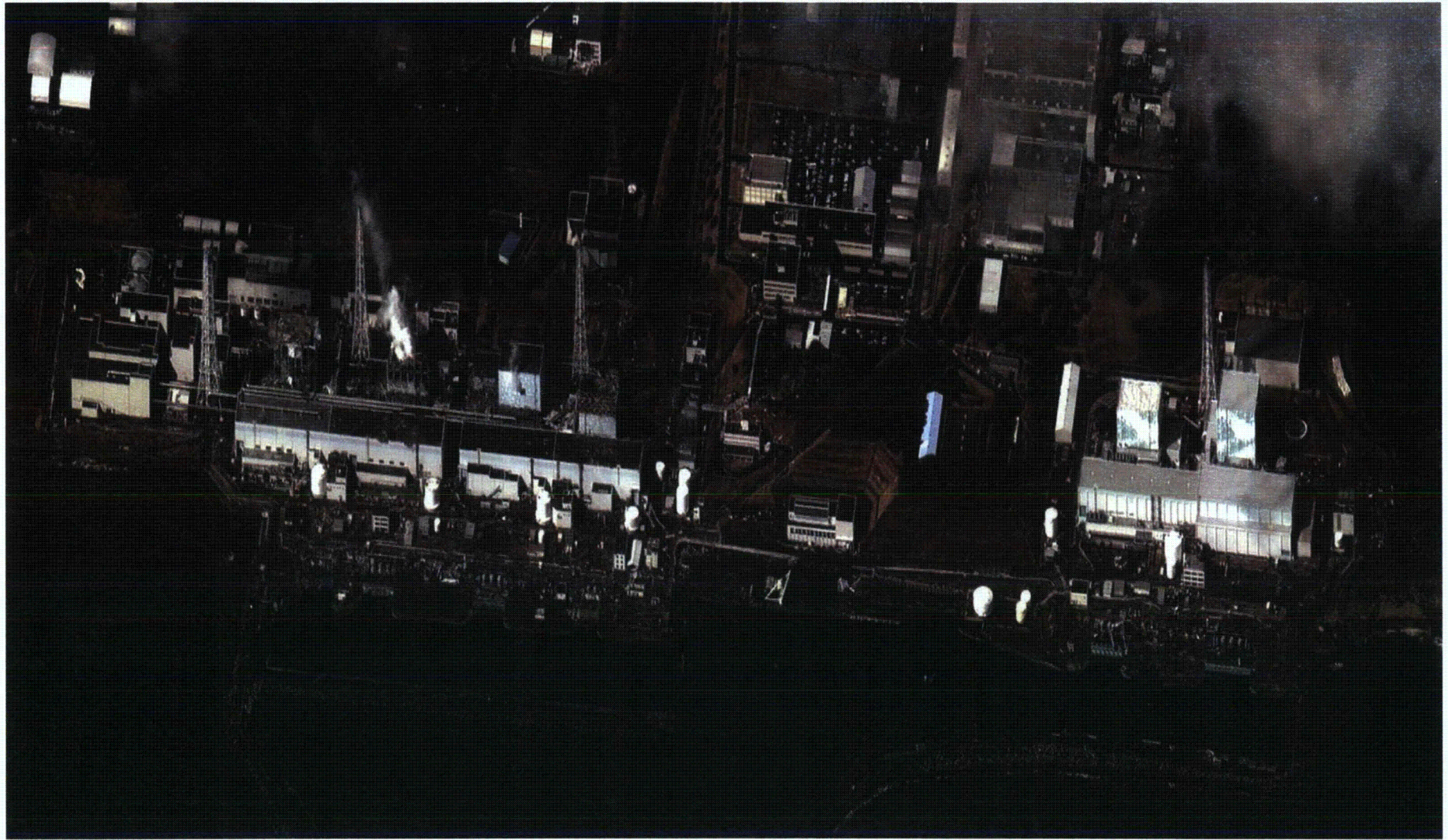


Reuters



TEPCO

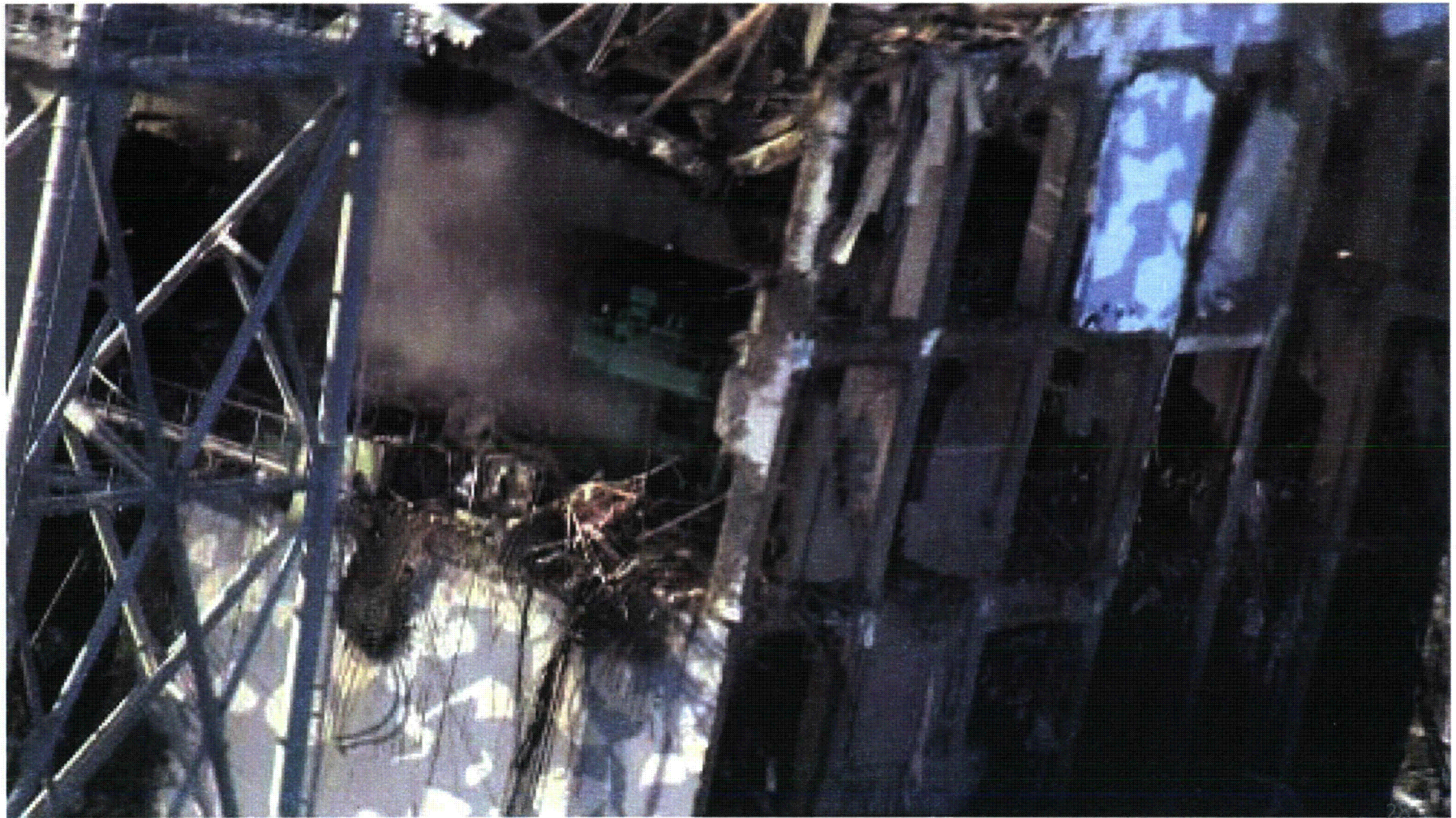
Units 1-6 After U4 Spent Fuel Pool Explosion



Units 1-4 After U4 Spent Fuel Pool Explosion 3/16

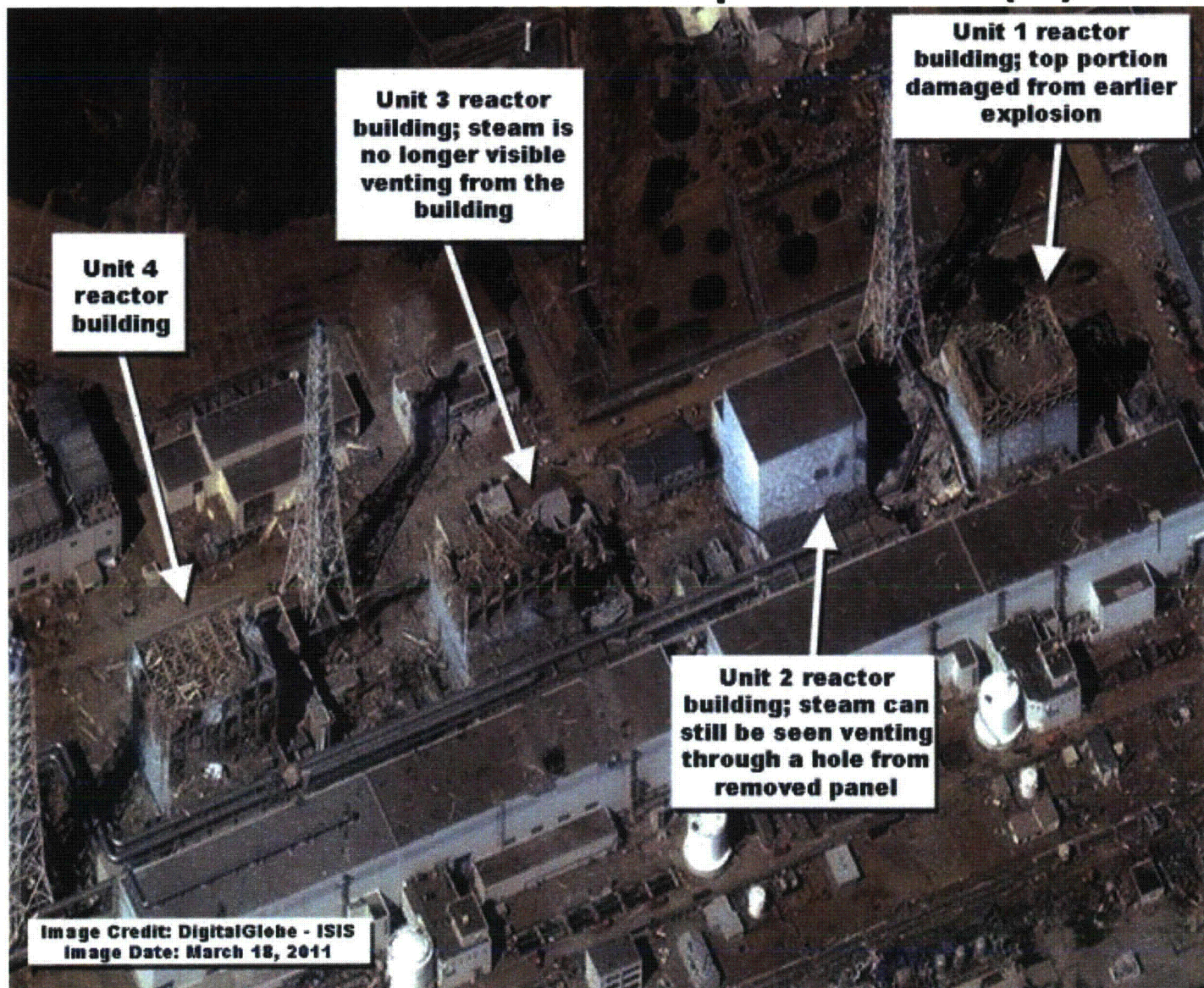


Unit 4 Fuel Pool



福島第二原子力発電所 4号機（2011年3月11日撮影）

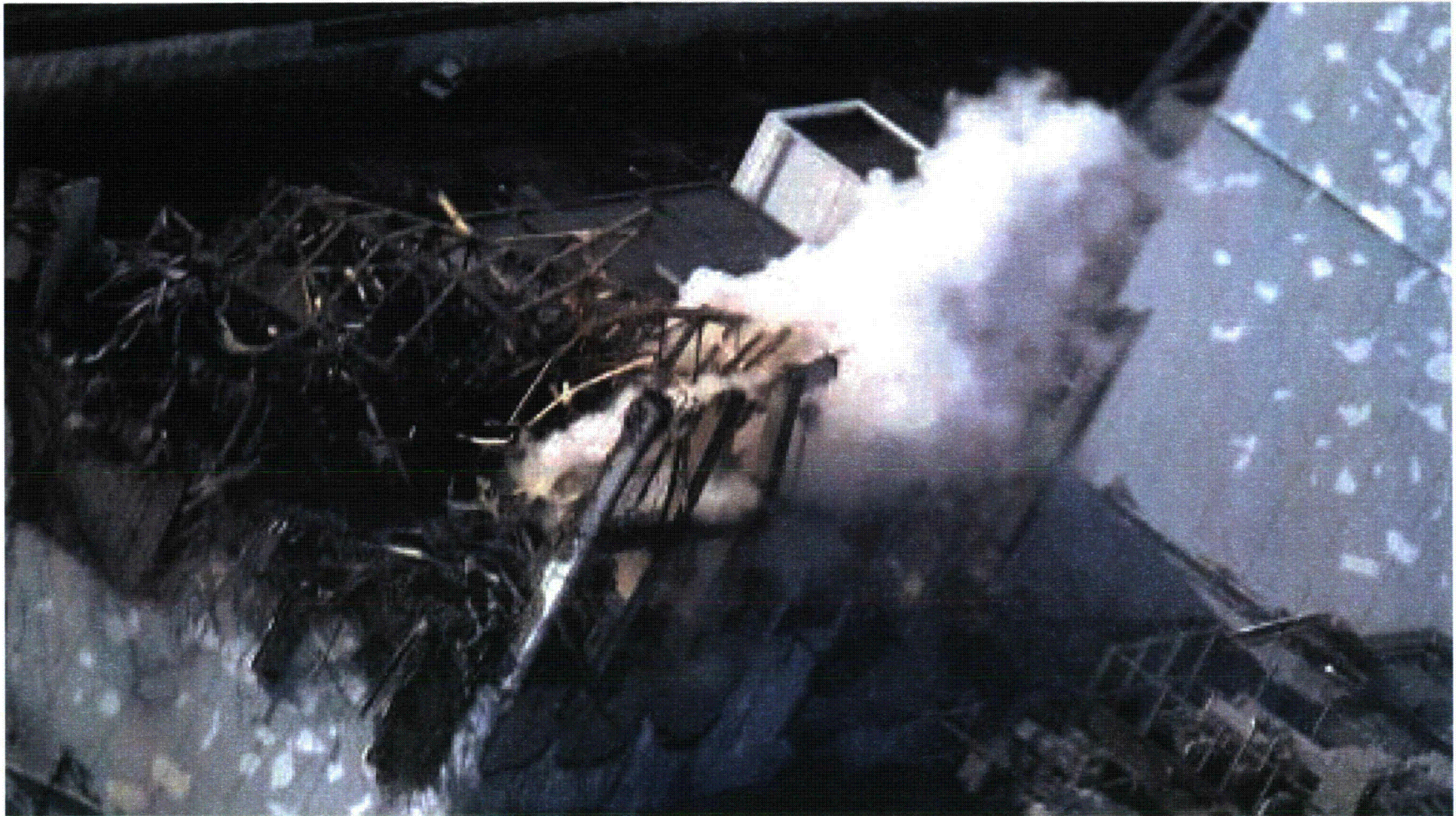
After Unit 4 Explosion(s)



Unit 3 & Unit 4



Unit 3 Spent Fuel Pool March 16



福島第一原子力発電所 3号機(3/16 PM撮影)

Water Spray to Unit 3 Pool Area

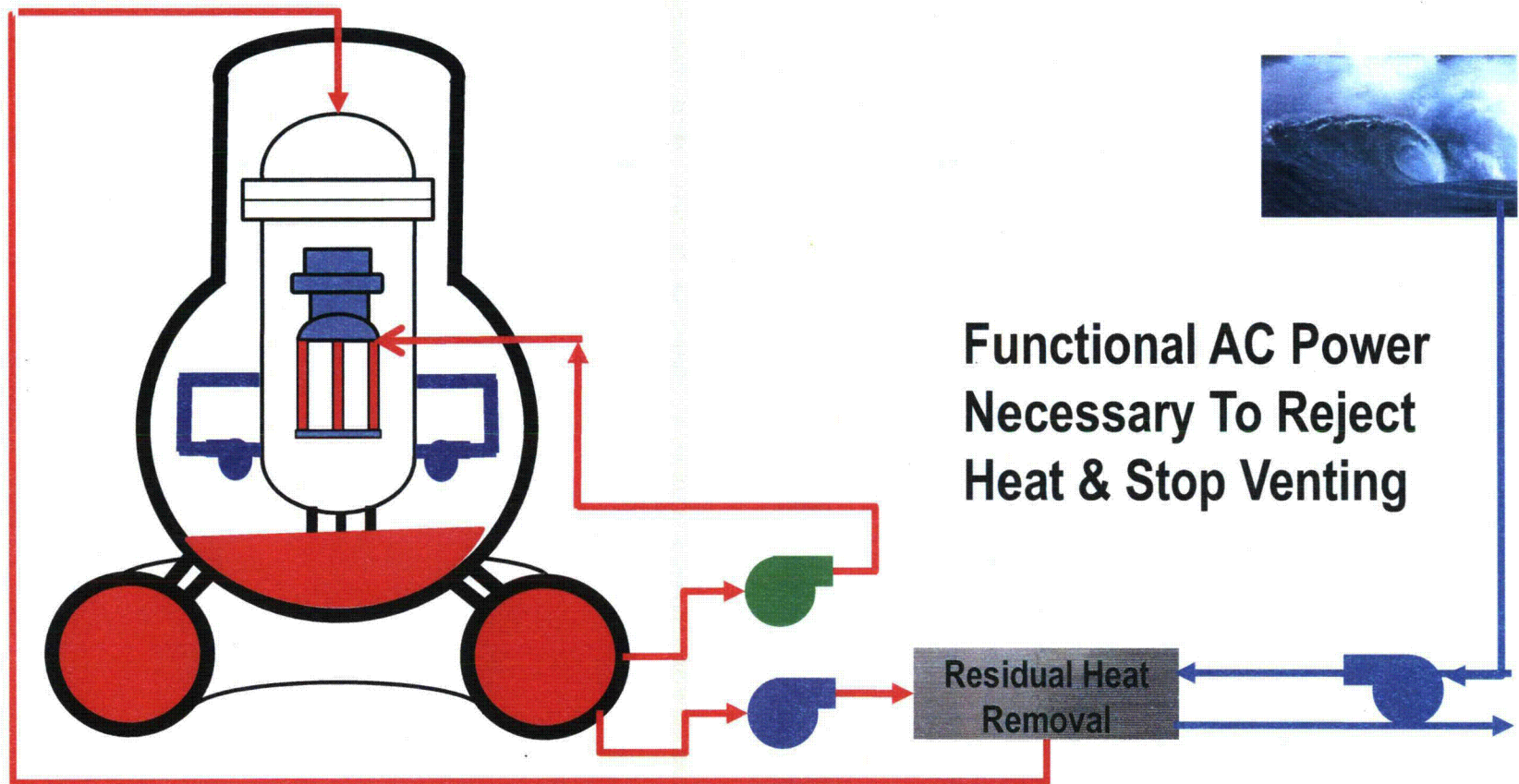


Unit 4 Reactor Building

Water Injection Boom To Spent Fuel Pool



Need Electric Motors To Establish Recirculation Cooling-Ongoing Effort



Working Conditions are Challenging

Restoring Power In High Radiation & Contaminated Areas



Internal Accident Recovery Phases

Per Basic Four Elements

- 1. Energy Heat Rejection Control**
 - 1. Open Feed & Bleed: Cools but Vents**
 - 2. Closed Residual Heat Removal Operation**
- 2. Gas Release Control/Mitigation**
 - 1. Containments**
 - 2. Filtration**
- 3. Liquid Release Control/Mitigation**
 - 1. Containments**
 - 2. Filtration**
- 4. Solids/Contamination Control Materials Management**
 - 1. Contain/package**
 - 2. Store/transport**
 - 3. Dispose**

External Phases Of Accident

- **Plant Accident Recovery Period**
 - Impossible Information Demands
 - Hours-Days-Weeks-?
- **Environmental Impact Period**
 - Public Perception/Impacts/Remediation
 - Weeks-Months-Years
- **Societal/Institutional Reactions Period**
 - Cultural
 - Political
 - Policy
 - Financial
 - Days-Weeks-Months-Years-Decades

Personal Fukushima Observations

- **Not a Public Health Catastrophe**
 - Inconsequential Compared to Earthquake/Tsunami Impacts
 - US Evacuation Decision Inconsistent
- **Is An Industrial Plant Catastrophe**
 - Three Severely Damaged Cores and Two Severely Damaged Spent Fuel Pool inventories
 - Units 1-4 Complete Loss, Units 5 & 6 Technically Recoverable
 - Cleanup Long, Expensive & Technically Achievable (But Much Larger than TMI)
- **Energy Dissipation is Getting Better, but Challenging**
 - Salt Cake Dissolution Concerns
 - Need Closed Cooling to Stop Venting
- **Environmental Release Mitigation is a Growing Challenge**
 - Technically at Plant
 - Environmental/Social Impact
 - Institutionally Challenging Infrastructure Ahead
- **Lessons Learned Ahead**
 - TMI Lessons Learned Improved US Nuclear Safety and Productivity
 - Most Painful Lessons are the Most Teachable
 - Hopefully the Fukushima Lessons Will Strengthen Nuclear Energy As TMI Did

Lake H. Barrett

Lake@Lbarrett.com

Lake Barrett is a part time independent consultant in the energy field. He has worked in the nuclear energy and nuclear materials management areas for over 4 decades, most recently as the former head of the US Department of Energy's Office of Civilian Nuclear Waste Management which is responsible for implementing the United States' programs for spent nuclear fuel and high-level radioactive waste, as mandated by the Nuclear Waste Policy Act. In that capacity, he lead the complex scientific Yucca Mountain Geologic Repository program through the statutory site selection process culminating with the Presidential site designation and following successful House and Senate votes.

He also served at U. S. Nuclear Regulatory Commission, where he was directly involved with the early response to the Three Mile Island reactor accident and became the Site Director, responsible for regulatory programs during the stabilization, recovery, and cleanup of the damaged reactor. He also has had extensive managerial and engineering experiences in DOE's Defence Programs and private industry at both Bechtel Power Corporation, with commercial nuclear power plants, and Electric Boat Division of General Dynamics with nuclear reactor and submarine systems design, operation, and decommissioning.

Esmaili, Hossein

From: Gibson, Kathy
Sent: Tuesday, March 15, 2011 8:25 AM
To: RES_DSA
Subject: Fw: 0730 EDT (March 15, 2011) USNRC Earthquake/Tsunami SitRep
Attachments: USNRC Earthquake-Tsunami Update.031511.0730EDT.docx

FYI

From: Sheron, Brian
To: Case, Michael; Coe, Doug; Correia, Richard; Gibson, Kathy; Lui, Christiana; Richards, Stuart; Sangimino, Donna-Marie; Scott, Michael; Uhle, Jennifer; Valentin, Andrea
Sent: Tue Mar 15 07:59:04 2011
Subject: FW: 0730 EDT (March 15, 2011) USNRC Earthquake/Tsunami SitRep

From: LIA07 Hoc
Sent: Tuesday, March 15, 2011 7:48 AM
To: Al Coons; Appleman Binkert; Bill King; Bill King 2; Charles Burrows; Charles Donnell; Conrad Burnside; Dan Feighert; Darrell Hammons; DOE NIT; DOT; DTRA; dudek; Elmer Naples; EOP; EPA; EPA2; Eric Sinibaldi; Gregory Simonson; Harry Sherwood; HHS; J Szymanski; Jim Kish; Johanna Berkey; John Holdren; K Donald; Karyn Keller; Lisa Hammond; Lukas McMichael; Maceck; Michelle Ralston; Nan Calhoun; Navy; NOC; NOC Duty Director; Nuclear SSA; Peter Lyons; Rebecca Thomson; RMT; Ron McCabe; Seamus O'Boyle; State; Stephen Trautman; Steve Colman; Steve Horwitz; Thomas Conran; Thomas Zerr; Tim Greten; Vanessa Quinn; William Webb; Andersen, James; Anderson, Joseph; Barker, Allan; Batkin, Joshua; Bradford, Anna; Brenner, Eliot; Bubar, Patrice; Castleman, Patrick; Coggins, Angela; Collins, Elmo; Dean, Bill; Decker, David; Dorman, Dan; Droggitis, Spiros; Franovich, Mike; Gibbs, Catina; Hahn, Matthew; Haney, Catherine; Harrington, Holly; Hipschman, Thomas; HOO Hoc; Howell, Art; Howell, Linda; Jaczko, Gregory; Johnson, Andrea; Johnson, Michael; Kahler, Robert; Leeds, Eric; Logaras, Harral; Loyd, Susan; Maier, Bill; Marshall, Michael; McCree, Victor; McDermott, Brian; McNamara, Nancy; Miller, Charles; Miller, Chris; Monninger, John; Nieh, Ho; NSIR_DDSP_ILTAB_Distribution; Orders, William; Ostendorff, William; Pace, Patti; Pearson, Laura; Satorius, Mark; Schmidt, Rebecca; Sharkey, Jeffry; Sheron, Brian; Snodderly, Michael; Sosa, Belkys; Speiser, Herald; Tifft, Doug; Trapp, James; Trojanowski, Robert; Warren, Roberta; Wiggins, Jim; Williams, Kevin; Wittick, Brian; Woodruff, Gena
Cc: LIA07 Hoc; LIA09 Hoc; LIA11 Hoc
Subject: 0730 EDT (March 15, 2011) USNRC Earthquake/Tsunami SitRep

Attached, please find a 0730 EDT situation report from the US Nuclear Regulatory Commission's Emergency Operations Center regarding the impacts of the earthquake/tsunami on March 15, 2011. This Update includes information on the Fukushima Daiichi Units 2 and 4.

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

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

-Jim

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

KK/KK-131

From: LIA07 Hoc
Sent: Thursday, March 31, 2011 5:56 PM
Subject: 1800 EDT (March 31, 2011) USNRC Earthquake/Tsunami Status Update
Attachments: USNRC Earthquake-Tsunami Update.033111.1800EDT.pdf

Attached, please find a 1800 EDT, March 31, 2011 status update from the US Nuclear Regulatory Commission's Emergency Operations Center regarding the impacts of the earthquake/tsunami.

This update contains new clarifying information regarding the Unit 4 spent fuel pool that is less optimistic than information shared earlier today.

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

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

-Sara

Sara K. Mroz
Executive Briefing Team Coordinator
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US Nuclear Regulatory Commission
Sara.Mroz@nrc.gov
LIA07.HOC@nrc.gov (Operations Center)

From: ET07 Hoc
Sent: Friday, April 01, 2011 1:03 PM
To: HOO Hoc
Subject: FYI - weekend CA calls

The Commissioner Assistants call for this weekend will be at 08:30 am for both Saturday and Sunday.

KKKK - 133

From: LIA07 Hoc
Sent: Friday, April 01, 2011 6:43 AM
To: LIA07 Hoc; Borchardt, Bill; Bradford, Anna; Cohen, Shari; Collins, Elmo; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Jaczko, Gregory; Johnson, Michael; Leeds, Eric; Loyd, Susan; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walker, Dwight; Walls, Lorena; Weber, Michael
Subject: Go Book Update - 0630 EDT, April 1, 2011
Attachments: April 1 0600 EDT one pager.pdf

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

The update includes:

- The 0600 EDT 04/01/11 One-Pager Briefing Sheet

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

-Jim

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

From: LIA07 Hoc
Sent: Friday, April 01, 2011 6:03 PM
To: Batkin, Joshua; Borchardt, Bill; Bradford, Anna; Coggins, Angela; Cohen, Shari; Collins, Elmo; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Jaczko, Gregory; Johnson, Michael; Leeds, Eric; Loyd, Susan; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walker, Dwight; Walls, Lorena; Weber, Michael
Subject: Go Book Update - 1800 EDT, April 1, 2011
Attachments: TEPCO Press Release 245.pdf; TEPCO Press Release 244.pdf; USNRC Earthquake-Tsunami Update.040111.1800EDT.pdf; April 1 1500 EDT one pager.docx; ET Chronology 4-1-11 1800.pdf

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

The updates include:

- The 1800 EDT, 04/01/11 Status Update
- The latest ET Chronology
- The latest "One Pager" (1500 EDT, 04/01/11)
- TEPCO Press Releases (244-245)

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

-Sara

Sara Mroz
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LIA07.HOC@nrc.gov (Operations Center)


Press Releases

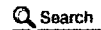
Press Release (Apr 01,2011) Plant Status of Fukushima Daini Nuclear Power Station (as of 4:00 pm April 1st)

[No particular update from the previous release]

Unit Status

- 1 · Reactor cold shutdown, stable water level, offsite power is available.
· No reactor coolant is leaked to the reactor containment vessel.
· Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
 - 2 · Reactor cold shutdown, stable water level, offsite power is available.
· No reactor coolant is leaked to the reactor containment vessel.
· Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
 - 3 · Reactor cold shutdown, stable water level, offsite power is available.
· No reactor coolant is leaked to the reactor containment vessel.
· Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
 - 4 · Reactor cold shutdown, stable water level, offsite power is available.
· No reactor coolant is leaked to the reactor containment vessel.
· Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
- Other A campaigner's sound truck entered the site through the west locked car gate around 1:08 pm today. After driving in the site, the car left through the same gate around 1:20 pm. We reported this event to the Fukushima Prefecture Police Department. We have shut the gate with our own vehicles after the campaigner's vehicle left.

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Press Releases

Press Release (Apr 01,2011)

The record of the earthquake intensity observed at Fukushima Daiichi Nuclear Power Station and Fukushima Daini Nuclear Power Station (Interim Report)

This is the record of the earthquake intensity observed at the lowest basement of the reactor buildings of Fukushima Daiichi Nuclear Power Station and Fukushima Daini Nuclear Power Station when the Tohoku-Taiheiyou-Oki Earthquake occurred approximately at 2:46pm on March 11th, 2011.

This report also contains Maximum Response Acceleration based on "Regulatory Guide for Reviewing Seismic Design of Nuclear Power Reactor Facilities (Revised in 2006)".

We will endeavor to keep collecting as much data as possible and examine it in more detail.

[Table]

The comparison between Basic Earthquake Ground Motion and the record of the earthquake intensity observed at the lowest basement of the reactor buildings of Fukushima Daiichi Nuclear Power Station and Fukushima Daini Nuclear Power Station when the Tohoku-Taiheiyou-Oki Earthquake occurred.

Observation Point (The lowest basement of reactor buildings)		Observed data (interim ^{※1}) Maximum Response Acceleration (gal)			Maximum Response Acceleration against Basic Earthquake Ground Motion (gal)		
		Horizontal (N-S)	Horizontal (E-W)	Vertical	Horizontal (N-S)	Horizontal (E-W)	Vertical
Fukushima Daiichi	Unit 1	460 ^{※2}	447 ^{※2}	258 ^{※2}	487	489	412
	Unit 2	348 ^{※2}	550 ^{※2}	302 ^{※2}	441	438	420
	Unit 3	822 ^{※2}	507 ^{※2}	231 ^{※2}	449	441	423
	Unit 4	281 ^{※2}	319 ^{※2}	200 ^{※2}	447	445	422
	Unit 5	311 ^{※2}	548 ^{※2}	256 ^{※2}	452	452	427
	Unit 6	298 ^{※2}	444 ^{※2}	244	445	448	415
Fukushima Daini	Unit 1	254	230 ^{※2}	305	434	434	512
	Unit 2	243	198 ^{※2}	222 ^{※2}	428	429	504
	Unit 3	277 ^{※2}	216 ^{※2}	208 ^{※2}	428	430	504
	Unit 4	210 ^{※2}	205 ^{※2}	288 ^{※2}	415	415	504

※ 1: The data above is interim and can be changed. ※ 2: The recording time was about 130-150 seconds.

[Reference]

Threshold for reactor scram at each unit(The reactor automatically stops if the intensity of the quake exceeds the threshold.)

	Threshold for reactor scram (gal)				
	Unit	Horizontal	Observation point	Vertical	Observation point
Fukushima Daiichi	1 - 5	135	B1F	100	B1F
	6		B2F		B2F
Fukushima Daini	1 - 4	150	2F	100	B2F
		135	B2F		

Glossary

- Observed Record of Earthquake Intensity
Record that indicates the intensity of an earthquake (Unit: gal)
- Regulatory Guide for Reviewing Seismic Design of Nuclear Power Reactor Facilities
Revised in September 2006 based on the newly accumulated knowledge on seismology and earthquake engineering and advanced technologies of

seismic design, this is a regulatory guide in reviewing the validity of the seismic design of nuclear power reactor facilities.

· Basic Earthquake Ground Motion Ss

A basic earthquake ground motion in seismic design of facility, stipulated in Regulatory Guide for Reviewing Seismic Design of Nuclear Power Reactor Facilities

· Maximum Response Acceleration against Basic Earthquake Ground Motion Ss

Assuming Basic Earthquake Ground Motion Ss in the evaluation of the earthquake-proof safety, this is the Maximum value of the quake of a building, which is expressed in acceleration.

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Press Releases

Press Release (Apr 01, 2011)

Status of TEPCO's Facilities and its services after the Tohoku-Taiheiyou-Oki Earthquake (as of 10:00AM)

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

Below is the status of TEPCO's major facilities.

*new items are underlined

[Nuclear Power Station]

Fukushima Daiichi Nuclear Power Station:

Units 1 to 3: shutdown due to the earthquake

(Units 4 to 6: outage due to regular inspections)

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

* Off-site power has been connected to Unit 1 to 6 by March 22, 2011.

* Unit 1

- The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36pm, March 12th.
- We started injection of sea water at 8:20 pm, March 12th, and then boric acid which absorbs neutron into the reactor afterwards.
- At approximately 2:30 am, March 23rd, we started the injection of sea water into the reactor from feed water system. After that, the injection of freshwater was started from 3:37 pm on March 25th (switched from the seawater injection). At 8:32 am, Mar 29th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 10:50 am on March 24th, white smoke was confirmed arising from the top of the reactor building.
- At approximately 11:30 am, March 24th, lights in the main control room were restored.
- At approximately 5:00 pm, March 24th, draining water from underground floor of turbine buildings into a condenser was started and it was paused at approximately 7:30 am, March 29th because we confirmed that the water level reached almost full capacity of a condenser. In order to move the water in the condenser into condensate reservoirs, water transfer from the condensate reservoirs to suppression pool's water surge-tanks has been conducted since around 0:00 pm, March 31st.
- From 1:03 pm, March 31st, the water spray by the concrete pumping vehicle was started, and finished at 4:04 pm.

* Unit 2

- At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in Clause 1, Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (failure of reactor cooling function). At 5:17 pm, March 14th, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation.
- At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there is a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.
Sea water injection to the reactor continued.
- On March 18th, power was delivered up to substation for backup power through offsite transmission line. We completed laying cable further to unit receiving facility in the building, and at 3:46 pm, March 20th the

- load-side power panel of the receiving facility started to be energized.
 - From 3:05 pm to 5:20 pm on March 20th, about 40 tons of seawater was injected into Unit 2 by TEPCO employees.
 - At approximately 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level where we could hardly confirm.
 - From around 4:00 pm to 5:00 pm on March 22nd, approximately 18 tons of sea water was injected into the spent fuel pool by TEPCO employees.
 - From 10:10 am on March 26th, freshwater (with boric acid) injection was initiated. (switched from the seawater injection) At 6:31pm, March 27th, transfer from the fire fighting pump to a temporary motor driven pump was made.
 - From 10:30 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated. The work was finished at 12:19 pm, March 25th. From 4:30 pm, March 29th, freshwater injection through Fuel Pool Cooling and Filtering System was initiated. (We switched from seawater to freshwater). The work was finished at 6:25 pm on March 29th. At 9:25 am, March 30th, we started fresh water injection by a temporary motor driven pump, but we switched the pump to the fire fighting pump due to the pump trouble. At 1:10 pm, March 30th, freshwater injection was suspended, because we found the crack on a part of the hose. At 7:05 pm, March 30th, freshwater injection was resumed and finished at 11:50 pm, March 31.
 - At approximately 4:46 pm, March 26th, lights in the main control room were restored.
 - At approximately 4:45 pm, March 29th, the water in condensate reservoirs was being transferred to suppression pool water surge-tanks to prepare for water transfer from a condenser to condensate reservoirs in order to drain water on the underground floor of the turbine building into a condenser.
- * Unit 3
- At 6:50 am, March 14th, while water injection to the reactor was under operation (injection of boric acid was done on Mar 13th), the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in the Article 15, the Clause 1 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure gradually decreased (as of 9:05 am, 490 kPa).
 - At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them were conscious) sustained injuries and were taken to the hospital by ambulances.
 - As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered. However the operation on March 16th was cancelled.
 - At 6:15 am, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable within a certain range. On March 20th, we were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
 - In order to cool spent fuel pool, water was sprayed by helicopters on March 17th with the cooperation of Self-Defense Forces.
 - At approximately past 7:00 pm, March 17th, Self-Defense Forces and the police started spraying water by water cannon trucks upon our request for the cooperation. At 8:09 pm, March 17th, they finished the operation.
 - At 2:00 pm, March 18th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At 2:45 pm, March 18th, the operation was finished.
 - At approximately 12:30 am, March 19th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 1:10 am, March 19th, the operation was finished. They resumed spraying water at 2:10 pm and finished at approximately 3:40 am, March 20th.
 - At approximately 9:30 pm, March 20th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 3:58 am, March 21th, they the operation was finished.
 - At approximately 3:55 pm, March 21st, light gray smoke was confirmed arising from the southeast side of the 5th floor roof of the Unit 3 building. The situation was reported to the fire department at approximately 4:21 pm. The parameters of reactor pressure vessel, reactor containment vessel, and monitored environmental data remained stable without significant change. However, employees working around Unit 3 evacuated to a safe location. On March 22nd, the color of smoke changed to somewhat white and it is slowly dissipating.
 - At approximately 3:10 pm on March 22nd, spraying water to Unit 3 by Tokyo Fire Department's Hyper Rescue and Osaka City Fire Department was conducted, and completed at approximately 4:00 PM on the same day.
 - At approximately 10:45 pm on March 22nd, lights in the main control room were restored.
 - At 11:00 am on March 23rd, the injection of sea water to spent fuel pool was conducted, and finished approximately at 1:20 pm on the same day.

- At 4:20 pm on March 23rd, light gray smoke was observed belching from Unit 3 building. The situation was reported to the fire department at 4:25 pm on March 23rd. The parameters of the reactor, the reactor containment vessel of Unit 3, and monitored figures around the site's immediate surroundings remained stable without significant change. To be safe, workers in the main control room of Unit 3 and around Unit 3 evacuated to a safe location. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, TEPCO employees confirmed the smoke has disappeared. Accordingly, workers evacuation was lifted.
- From approximately 5:35 am on March 24th, sea water injection through Fuel Pool Cooling and Filtering System was initiated, and finished at approximately 4:05 pm on the same day.
- From 1:28 pm on March 25th, Hyper Rescue team started water spray. The work finished at 4:00 pm on March 25th.
- From 6:02 pm on March 25th, the injection of freshwater to the reactor was started (switched from the seawater injection). At 8:30 pm on March 28th, the injection of fresh water is switched to temporary electricity pumps from the fire engine pumps.
- At approximately 12:34pm March 27th, the injection of water by the concrete pump truck was started. At approximately 2:36 pm, March 27th, the operation was finished.
- At approximately 2:17pm March 29th, the injection of fresh water by the concrete pump truck was started. (Sea water had been injected so far and transfer from seawater to freshwater was made). The water injection was finished at 6:18 PM, March 29th.
- At approximately 5:40 pm, March 28th, the water in condensate reservoirs was being transferred to suppression pool water surge-tanks to prepare for water transfer from a condenser to condensate reservoirs in order to drain water on the underground floor of the turbine building into a condenser. We finished the transfer work at approximately 8:40 am, March 31st.
- From 4:30 pm, March 31st, the water spray by the concrete pumping vehicle was started, and finished at 7:33 pm.

* Unit 4

- At approximately 6:00 am, March 15th, an explosive sound was heard and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employees confirmed that the fire was out.
- At approximately 5:45 am on March 16th, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approximately 6:15 am, TEPCO staff confirmed at the site that there are no signs of fire.
- At approximately 8:21 am on March 20th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and they finished the operation at approximately 9:40 am. At approximately 6:45 pm spraying water was started by Self-Defenses' water cannon trucks and finished at approximately 7:45 pm.
- At approximately 6:30 am, March 21st, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At approximately 8:40 am, March 21, they had finished the operation.
- On March 21st, cabling has been completed from temporary substation to the main power center.
- From approximately 5:20 pm on March 22nd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 8:30 pm on the same day.
- From approximately 10:00 am on March 23rd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 1:00 pm on the same day.
- From approximately 2:35 pm on March 24th, spraying water by the concrete pumping vehicle was conducted and ended at approximately 5:30 pm on the same day.
- From 6:05 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated and finished at approximately 10:20 am on the same day.
- From 7:05 pm on March 25th, water spray by the concrete pumping vehicle was started and finished at 10:07 pm on March 25th.
- From 4:55 pm on March 27th, water spray by the concrete pumping vehicle was started and finished at 7:25 pm on March 27th.
- At approximately 11:50 am on March 29th, lights in the main control room were restored.
- From 2:04 pm on March 30th, water spray by the concrete pumping vehicle was started and finished at 6:33 pm on March 30th.
- From 8:28am, April 1st, the water spray by the concrete pumping vehicle was started.

* Unit 5 and 6

- At 5:00 am on March 19th, we started the Residual Heat Removal System Pump (C) of Unit 5 in order to cool the spent fuel pool. At 10:14 pm, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
- Unit 5 has been in reactor cold shutdown since 2:30 pm on March 20th.
- Unit 6 has been in reactor cold shutdown since 7:27 pm on March 20th.

- At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
 - At approximately 5:24 pm on March 23rd, the temporary Residual Heat Removal System Seawater Pump automatically stopped when its power source was switched. We restarted the pump at around 4:14 pm, March 24th, and resumed cooling of reactor at around 4:35 pm.
 - * On March 18th, regarding the spent fuel in the common spent fuel pool, we have confirmed that the water level of the pool is secured. At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
 - * common spent fuel pool: a spent fuel pool for common use set in a separate building in a plant site in order to preserve spent fuel which are transferred from the spent fuel pool in each Unit building.
 - * On March 17th, we patrolled buildings for dry casks and found no signs of abnormal situation for the casks by visual observation. A detailed inspection is under preparation.
 - * dry cask: a measure to store spent fuel in a dry storage casks in storages. Fukushima Daiichi Nuclear Power Station started to utilize the measure from August 1995.
 - * In total 13 fire engines are lent for spraying water to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments* as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided.
 - * On March 21st, 23rd to 30th, we detected technetium, cobalt, iodine, cesium, tellurium, barium, lanthanum and molybdenum from the seawater around the discharge canal of the station.
 - * On March 20th, 21st, 23rd to 30th, we detected iodine, cesium, tellurium and ruthenium in the air collected at the site of Fukushima Daiichi Nuclear Power Station.
 - * Plutonium has detected from the sample of soil at the site of Fukushima Daiichi Nuclear Power Station collected on 21st and 22nd of March, Concentration level of Plutonium detected was same as that of under usual environment and it is thought not to be harmful to human health. We will strengthen environmental monitoring of power station and surrounding environment.
 - * On March 28th, we detected radioactive materials contained in the puddles found in the turbine building of Unit 1 to 4.
 - * At approximately 3:30 pm, March 27th, we found water pooling in the vertical shaft of the trench outside of the turbine buildings for Units 1 to 3. The radiation dose at the surface of the water amounted 0.4 mSv/h in Unit 1 and over 1,000 mSv/h in Unit 2. We could not confirm the amount of the radiation dose in Unit 3. We will keep observing the condition of the water in the vertical shaft.
 - On March 29th, we detected niobium, tellurium, ruthenium, silver, tellurium, iodine, cesium, and ruthenium in the water collected at the trench of unit 1.
 - On March 30th, we took samples from the water in the trench of Unit 2 and 3, and conducted nuclide analysis on them. We are now confirming the results of the analysis.
 - * Since around 9:20 am today, March 31st, the water transfer from the vertical shaft of Unit 1 to the reservoir of the centralized environmental facility was conducted. We finished the task around 11:25 am of the same day.
 - * We found a puddle of water at the main building of the centralized environmental facility process. We analyzed and detected approximately $1.2 \times 10^3 \text{ Bq/cm}^3$ of radioactivity in full dose in the Controlled Area and $2.2 \times 10^3 \text{ Bq/cm}^3$ in full dose in the Non-Controlled Area on March 29.
 - * A barge of the U.S. Forces with fresh water to be used to cool down reactors etc. was towed by a ship of Maritime Self-Defense Force and at 3:42 pm on March 31st 2011, came alongside the pier. As soon as the water is ready to be supplied, we will replenish the fresh water with filtrate tanks.
 - * We will continuously endeavor to securing safety, and monitoring of the surrounding environment.
- Fukushima Daiichi Nuclear Power Station:**
Units 1 to 4: shutdown due to the earthquake
- * The national government has instructed evacuation for those local residents within 10km radius of the periphery.
 - * In order to achieve cold shutdown, reactor cooling function was restored

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

* At 2:30 pm on March 30th, the power source of the residual heat removal system(B) to cool the reactor of Unit 1 was secured from an emergency power source in addition to an offsite power. This means that all the units secure backup power sources (emergency power sources) for the residual heat removal systems(B).

* (Unit 1)

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

* (Unit 4)

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

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

Kashiwazaki Kariwa Nuclear Power Station:

Units 1, 5, 6, 7: normal operation

(Units 2 to 4: outage due to regular inspection)

[Thermal Power Station]

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

[Hydro Power Station]

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

[Transmission System, etc.]

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

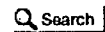
[Supply and Demand Status within TEPCO's Service Area to Secure Stable Power Supply]

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

[Others]

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

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Press Releases

Press Release (Mar 31,2011) Partial amendment of responsibility of Managing Directors

Please be informed that the following changes to responsibilities of Managing Directors have been made as of 31st March 2011.

Note

(* new)

Name		Delegation of Authority	Scope of work (reference)
President Masataka Shimizu	New	*General Manager, Fukushima Nuclear Influence Response Division	
	Old		
Executive Vice President Norio Tsuzumi	New	* Deputy General Manager, Fukushima Nuclear Influence Response Division and Deputy General Manager, Nuclear Power & Plant Siting Division	General Affairs, Administration
	Old	Deputy General Manager, Nuclear Power & Plant Siting Division	General Affairs, Administration
Managing Director Naomi Hirose	New	* Deputy General Manager, Fukushima Nuclear Influence Response Division	Real Estate Acquisition and Management Dept, International Affairs Dept
	Old		Real Estate Acquisition and Management Dept, International Affairs Dept

End

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Press Releases

Press Release (Apr 01,2011) Implementation Plan of Rolling Blackouts on and after April 2, 2011

Due to the tight power supply-demand balance, TEPCO has been implementing rolling blackouts since Monday, March 14. We sincerely regret causing anxiety and inconvenience to our customers and the society. We appreciate your cooperation in conserving electricity consumption. For customers who will be subject to rolling blackouts, please be prepared for the announced blackout periods. Also, for the customers who are not subject to blackouts, we would appreciate your continuous cooperation in reducing electricity usage by turning off unnecessary lightings and electrical appliances. We will inform the implementation plan of rolling blackouts on and after April 2, 2011 as follows:

o Implementation plan of rolling blackout from April 2 (Sat) to April 4 (Mon)

On April 2, Saturday, no rolling blackout will be implemented in any time periods based on the today's power demand, the weather forecast tomorrow on April 2 and the trend of the power supply. Also on April 3 and 4, no rolling blackout will be implemented in any time periods based on the most recent power demand and the trend of the power supply. Because of your cooperation in conserving electricity, we can avoid the rolling blackout for tomorrow from April 2 to April 4. We appreciate your continuous cooperation

o Implementation plan of rolling blackouts on April 5 (Tue)- April 8 (Fri) Please refer to the appendix for details.

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

[Others]

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

<Reference>

o Prediction of demand and supply from April 1 to April 4

(MW)

	April 1	April 2	April 3	April 4
Estimated Demand	33,500	32,000	34,000	36,500
Supply Capacity	38,000	37,000	37,000	39,000

* Prediction of demand

- April 2: Since the temperature is forecasted to be higher than normal and it is Saturday, we assume the estimated peak demand on April 2 will be 32,000MW, which is lower than that of today April 1.
- April 3: Since the temperature is forecasted to be lower than normal, we assume the estimated peak demand on April 3 will be 34,000MW, which is higher than that of April 2.
- April 4: Since the temperature is forecasted to be lower than normal, we assume the estimated peak demand on April 4 will be 36,500MW, which is higher than that of today April 1.

* Estimated demand and supply capacity may change depending on the situation of the day.

Appendix: Weekly Rolling Blackout Tentative Plan from April 2(Sat)to April 8(Fri) (PDF 61.2KB)

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Press Releases

Press Release (Apr 01,2011)

Plant Status of Fukushima Daiichi Nuclear Power Station (as of 9:00 PM April 1st)

*Updates are underlined

All 6 units of Fukushima Daiichi Nuclear Power Station have been shut down.

Unit 1 (Shut down)

- Explosive sound and white smoke were confirmed after the big quake occurred at 3:36 pm Mar 12th. It was assumed to be hydrogen explosion.
- At approximately 2:30 am on March 23rd, seawater injection to the nuclear reactor through the feed water system was initiated.
- At approximately 10:50 am on March 24th, white fog-like steam arising from the roof part of the reactor building was observed.
- We had been injecting seawater into the reactor, but from 3:37 pm on March 25th, we started injecting freshwater.
- We had been injecting fresh water to the reactor using fire engines; however we switched over utilizing temporary electrical pump at 8:32 am on March 29th.

Unit 2 (Shut down)

- At approximately 6:00 am on March 15th, an abnormal noise began emanating from nearby Pressure Suppression Chamber and the pressure within the chamber decreased.
- At 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level to nearly non-existent.
- We have been injecting seawater into the reactor, but from 10:10 am on March 26th, we started injecting freshwater (with boric acid).
- We had been injecting fresh water in to the reactor utilizing fire pump, however, we switched over to utilizing temporary electrical pump from 6:31 pm on March 27th.

Unit 3 (Shut down)

- Explosive sound and white smoke were confirmed at 11:01am March 4th. It was assumed to be hydrogen explosion.
- At 8:30am on March 16th, fog like steam was confirmed arising from the reactor building.
- At approximately 6:15 am on March 17th the pressure of the Suppression Chamber has temporarily increased. We were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
- At approximately 4:00 pm, March 21st, light gray smoke was confirmed arising from the floor roof of the Unit 3 building. On March 22nd, the color of smoke changed to somewhat white and it is slowly dissipating.
- At around 4:20 pm on March 23rd, our staff confirmed light black smoke belching from the Unit 3 building. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, our employee found no signs of smoke.
- We had been injecting seawater into the reactor pressure vessel, but from 6:02 pm on March 25th, we started injecting freshwater.
- We had been injecting fresh water in to the reactor utilizing fire pump, however, we switched over to utilizing temporary electrical pump from 8:30 pm on March 28th.

Unit 4 (outage due to regular inspection)

- At approximately 6 am on March 15th, we confirmed the explosive sound and the sustained damage around the 5th floor rooftop area of the Nuclear Reactor Building.
- On March 15th and 16th, we respectively confirmed the outbreak of fire at the 4th floor of the northwestern part of the Nuclear Reactor Building. We immediately reported this matter to the fire department

and the related authorities. TEPCO employees confirmed that each fire had already died down by itself.

- At this moment, we do not consider any reactor coolant leakage inside the reactor happened.

Unit 5 (outage due to regular inspection)

- Sufficient level of reactor coolant to ensure safety is maintained.
- At 5 am, March 19th, we started the Residual Heat Removal System Pump (C) in order to cool the spent fuel pool.
- At 2:30 pm, March 20th, the reactor achieved reactor cold shutdown. At around 5:24 pm on March 23rd, when we switched the temporary Residual Heat Removal System Seawater Pump, it has stopped automatically. At around 4:14 pm, March 24th we replaced the pump, and restarted cooling of reactor at around 4:35 pm.
- At this moment, we do not consider any reactor coolant leakage inside the reactor happened.

Unit 6 (outage due to regular inspection)

- Sufficient level of reactor coolant to ensure safety is maintained.
- We completed the repair work on the emergency diesel generator (A).
- At 10:14 pm, March 19th, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
- At 7:27 pm, March 20th, the reactor achieved reactor cold shutdown.
- In relation to the two seawater side pumps of the Residual Heat Removal System, we switched the power source from temporary to permanent at 3:38 PM and 3:42PM, Mar 25 respectively.
- At this moment, we do not consider any reactor coolant leakage inside the reactor happened.

Today's work for cooling the spent fuel pools

- Water spraying by the concrete pump truck to Unit 4 was conducted from 8:28 am to 2:14 pm.
- From 2:56 pm April 1st, freshwater injection to Unit 2 was conducted by a temporary motor driven pump, and finished at 5:05 PM on the same day.
- We are considering further spraying subject to the conditions of spent fuel pools.

Draining water from underground floor of turbine buildings

- In regard with transferring water from a condensate storage tank to a suppression pool water surge-tank in unit 1, work began at 0:00 pm March 31st.
- In regard with transferring water from a condensate storage tank to a suppression pool water surge-tank in unit 2 from 4:45 pm March 29th to 11:50 am, April 1st.

Casualties

- Presence of 2 TEPCO employees at the site is not confirmed on March 11th.
 - On March 24th, it was confirmed that 3 workers from cooperative companies who were in charge of cable laying work in the 1st floor and the underground floor of turbine building were exposed to the radiation dose of more than 170 mSv. 2 of them were confirmed that their skins on legs were contaminated. After they were decontaminated, since there was a possibility of beta ray burn injury, they were transferred to Fukushima Medical University Hospital. The third worker was also transferred to Fukushima Medical University Hospital on March 25th. Later, the 3 workers were transferred to National Institute of Radiological Sciences in Chiba Prefecture. They all left the hospital on March 28th. Regarding this event, TEPCO has reported to the related government ministries and agencies on measures to be taken to assure appropriate radiation dose control and radiation exposure related operations.
- We will inform the related parties of countermeasures and continue to take all possible measures to future management.

Others

- We measured radioactive materials (iodine etc.) inside of the nuclear power station area (outdoor) by monitoring car and confirmed that radioactive materials level is getting higher than ordinary level. As listed below, we have determined that specific incidents stipulated in article 15, clause 1 of Act on Special Measures Concerning Nuclear Emergency Preparedness (Abnormal increase in radiation dose measured at site boundary) have occurred.
- Determined at 4:17 pm Mar 12th (Around Monitoring Post 4)
- Determined at 8:56 am Mar 13th (Around Monitoring Post 4)
- Determined at 2:15 pm Mar 13th (Around Monitoring Post 4)
- Determined at 3:50 am Mar 14th (Around Monitoring Post 6)
- Determined at 4:15 am Mar 14th (Around Monitoring Post 2)
- Determined at 9:27 am Mar 14th (Around Monitoring Post 3)
- Determined at 9:37 pm Mar 14th (Around main entrance)
- Determined at 6:51 am Mar 15th (Around main entrance)
- Determined at 8:11 am Mar 15th (Around main entrance)
- Determined at 4:17 pm Mar 15th (Around main entrance)
- Determined at 11:05 pm Mar 15th (Around main entrance)
- Determined at 8:58 am Mar 19th (Around MP5)

From now on, if the measured figure fluctuates and goes above and below

500 micro Sv/h, we deem that as the continuous same event and will not regard that as a new specific incidents stipulated in article 15, clause 1 of the Act on Special Measures Concerning Nuclear Emergency Preparedness (Abnormal increase in radiation dose measured at site boundary) has occurred. In the interim, if we measure a manifestly abnormal figure and it is evident that the event is not the continuous same event, we will determine and notify.

- The national government has instructed evacuation for those local residents within 20km radius of the periphery and evacuation to inside for those residents from 20km to 30km radius of the periphery, because it is possible that radioactive materials are discharged.
- At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm (conducted by TEPCO).
- At around 3:37 pm, March 24th, electricity supply to common spent fuel pool has started from external power source. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
- We found no signs of abnormal situation for the casks by visual observation during the patrol activity. A detailed inspection is under preparation.
- At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
- In total 12 fire engines are lent for the water spraying to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments* as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided by Niigata City Fire Headquarter and Hamamatsu City Fire Headquarter.
- *: Koriyama Fire Department, Iwaki Fire Brigade Headquarters, Fire Headquarters of Sukagawa District Wide Area Fire-fighting Association, Yonezawa City Fire Headquarters, Utsunomiya City Fire Headquarters, Fire Headquarters of Aizu-Wakamatsu wide area municipal association, Saitama City Fire Bureau, and Niigata City Fire Bureau.
- By March 22nd, Units 1 through 6 were started to be energized from the external power source.
- At 3:30PM, March 27th, we found that there was water in the trenches of Units 1 to 3. The radioactive emission at the surface of the water was 0.4mSv/h for Unit 1 and over 1,000mSv/h for Unit 2. As for Unit 3, we couldn't have access to the surface because of debris. We will continue to monitor water in the trenches.
- On March 28th, a puddle of water was found at a centralized environmental facility process main building. As a result of a radioactivity analysis, on March 29th, we detected approximately $1.2 \times 10\text{Bq/cm}^3$ in a full dose at a radiation controlled area and $2.2 \times 10\text{Bq/cm}^3$ in a full dose at a non-controlled area.
- At 12:03 pm, March 29th, when taking off the flange of the pipe of the seawater piping of the Residual Heat Removal System, 3 workers from our subcontractor were soaked with water in the pipe. After wiping the water off, we confirmed that there was no radioactive contamination to their bodies.
- At 12:21 pm, March 31st, campaigner's sound truck (1 driver) tried to enter the site from the site's main gate, however it left after it was blocked to enter. We reported this incident to Fukushima Prefectural Police Department.
- A barge of the U.S. Forces with freshwater to be used to cool down reactors etc. was towed by a ship of Maritime Self-Defense Force and at 3:42 pm on March 31st 2011, came alongside the pier. We began to replenish the water with filtrate tanks at around 3:58 pm April 1st.
- At around 11:35 am April 1st, a worker fell into the sea when he got into a barge of the U.S. Forces to repair a hose of the ship. The worker was rescued immediately, and was not injured and not contaminated. The worker will be checked using the whole-body counter to ensure his health.
- Monitoring posts of No.1 -No.8 set up near the boundary of power station area have been restored. We will periodically monitor the data and announce the results of monitoring.
- We will continue to take all measures to ensure the safety and to continue monitoring the surrounding environment around the Power Station.

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NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION

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No. 11-062

April 1, 2011

NRC APPOINTS TASK FORCE MEMBERS AND APPROVES CHARTER FOR REVIEW OF AGENCY'S RESPONSE TO JAPAN NUCLEAR EVENT

The Nuclear Regulatory Commission has named six senior managers and staff to its task force for examining the agency's regulatory requirements, programs, processes, and implementation in light of information from the Fukushima Daiichi site in Japan, following the March 11 earthquake and tsunami.

The task force will be led by Dr. Charles Miller, Director of the NRC's Office of Federal and State Materials and Environmental Management Programs. Other task force members are Daniel Dorman, Deputy Director of the Office of Nuclear Material Safety and Safeguards (NMSS); Jack Grobe, Deputy Director of the Office of Nuclear Reactor Regulation (NRR); Gary Holahan, Deputy Director of the Office of New Reactors (NRO); Nathan Sanfilippo, Executive Technical Assistant, Office of the Executive Director for Operations; and Amy Cubbage, Team Leader, NRO.

"The task force will talk to agency technical experts and gather information to conduct a comprehensive review of the information from the events at the Fukushima Daiichi nuclear complex and make recommendations for any improvements needed to our regulatory system," Miller said. "We plan to provide our observations, conclusions and recommendations in a written report that will be made public approximately 90 days after we start our review."

According to the charter, the task force will conduct a near-term review and identify topics for assessment for a longer term review. Initially, the task force will identify potential near-term actions that affect U.S. power reactors, including their spent fuel pools. Areas to be reviewed include station blackout (loss of all A/C power for a reactor), external events that could lead to a prolonged loss of cooling, plant capabilities for preventing or dealing with such circumstances, and emergency preparedness. The task force will draw from ongoing NRC inspections to verify availability of plant equipment, procedures, and other resources currently required for dealing with such events. The task force will also gather information from domestic and international sources while remaining independent of any industry initiatives.

The task force expects to develop recommendations for Commission consideration on whether it should require immediate enhancements at U.S. reactors and any changes to NRC regulations, inspection procedures, and licensing processes.

KKKK-136

On May 12 and June 16, the task force plans to brief the Commission in public meetings on the status of the review. Recommendations will be reported in a July 19 Commission meeting, which will be open to the public. The report will also be made available to the public. The task force charter, at the end of this release, will also be available through the NRC's ADAMS electronic document database by entering ML11089A045 under the "Simple Search" tab on this webpage: <http://wba.nrc.gov:8080/ves/>.

Biographical information for the task force members is provided below.

Charles L. Miller has worked at NRC since 1980, has served as the Director of the Office of Federal and State Materials and Environmental Management Programs since 2006. He has held various management positions in offices dealing with safety of nuclear reactors, waste and materials, including nuclear medicine. Miller received a bachelor's degree in engineering from Widener University, a master's and doctorate in chemical engineering from the University of Maryland, and is a registered professional engineer licensed in the District of Columbia.

Daniel H. Dorman has 20 years of service with the NRC and has served as the Deputy Director of the Office of Nuclear Material Safety and Safeguards. During his career at NRC, Dorman also worked in the offices of NRR, Nuclear Regulatory Research (RES), and Nuclear Security and Incident Response (NSIR). Prior to joining the NRC, Dorman served in the U.S. Navy's nuclear power program. He received a bachelor's degree in naval architecture and marine engineering from the Webb Institute of Naval Architecture.

Jack Grobe has worked for the NRC for over 30 years and has served as the Deputy Office Director for Engineering in NRR since 2007. He started as an inspector in the NRC regional office outside Chicago, Illinois, and moved up to chair a number of task force groups including the Davis-Besse Oversight Panel following discovery of the reactor vessel head corrosion and Nuclear Security Special Projects to enhance reactor capabilities to deal with fires or explosions caused by potential malevolent acts. Grobe has a master's degree in bionucleonics and a bachelor's degree in nuclear engineering, both from Purdue University.

Gary M. Holahan has 35 years of service with the NRC and has served as the Deputy Director for NRO since 2006. During his career at the NRC, Holahan has worked in a number of technical and management positions, including nine years as the Director of NRR's Division of Systems Safety and Analysis, and in the Chairman's office where he covered NRC reactor and research programs. Holahan's assignments have also included the Three Mile Island Lessons Learned Task Force, the post-9/11 development of security advisories and orders, and the U.S. - Canada Blackout Report. Mr. Holahan received a bachelor's degree in physics from Manhattan College and a master's degree in nuclear engineering from the Catholic University of America.

Nathan T. Sanfilippo has worked for the NRC for nine years and has served as an Executive Technical Assistant in the Office of the Executive Director for Operations since May 2010. Prior to his current position, he worked in NRR, NRO, and NSIR on nuclear power plants performance assessment, emergency preparedness inspections, new reactor licensing, and aircraft attack mitigation measures. Sanfilippo earned a bachelor's degree in materials science and

engineering and a minor in global business strategies from the Pennsylvania State University, as well as a certificate in legislative studies from the Government Affairs Institute at Georgetown University.

Amy E. Cabbage has worked at the NRC for 22 years and currently serves in NRO as a team leader. Cabbage has extensive experience working on boiling-water reactor system reviews and as the lead project manager for the Economic Simplified Boiling Water Reactor (ESBWR) Design Certification. Cabbage received a bachelor's degree in mechanical engineering from the University of Virginia.

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News releases are available through a free *listserv* subscription at the following Web address: <http://www.nrc.gov/public-involve/listserver.html>. The NRC homepage at www.nrc.gov also offers a SUBSCRIBE link. E-mail notifications are sent to subscribers when news releases are posted to NRC's website.

From: Jones, Cynthia
Sent: Friday, April 01, 2011 4:53 PM
To: PMT02 Hoc
Cc: PMT11 Hoc
Subject: RE: IAEA Source Term data

Yes, but it was already sent by Michele to Charlie Tinkler on Wed this week.....

-----Original Message-----

From: PMT02 Hoc
Sent: Friday, April 01, 2011 4:45 PM
To: Jones, Cynthia
Cc: PMT11 Hoc
Subject: RE: IAEA Source Term data

The plausible realistic RASCAL source term was sent on Thurs 03/24. Is that the one you want?

Thanx

Fritz
PMT Dose Analyst (PMT02)
NRC Operation Center

-----Original Message-----

From: Jones, Cynthia
Sent: Friday, April 01, 2011 4:36 PM
To: PMT02 Hoc
Subject: RE: IAEA Source Term data

The request to RES for running the MELCOR run for the Plausible realistic case (not any of those below) was only sent on Wed around Noon (it to re-run the one RASCAL sent to the WH & NARAC last Friday. Just check with RES (C Tinkler) to see when he can get back to us - next Monday/Tues I assume....

-----Original Message-----

From: PMT02 Hoc
Sent: Friday, April 01, 2011 4:32 PM
To: Jones, Cynthia
Subject: RE: IAEA Source Term data

Cyndi,

Last Saturday night 03/19 the MELCOR source term was sent to NARAC.

The "Supercore - Trans-Pacific" source term from RASCAL was sent on 03/18

The "Supercore - Plausible" source term from RASCAL was sent on 03/24

The IAEA source term looks closer to the "Supercore - Plausible" RASCAL source terms - I haven't checked MELCOR yet.

Thanx,

Fritz
PMT Dose Analyst (PMT02)
NRC Operation Center

-----Original Message-----

From: Jones, Cynthia
Sent: Friday, April 01, 2011 4:08 PM
To: PMT02 Hoc
Subject: RE: IAEA Source Term data

RASCAL - See the notebook for the dose assessors and check last Sat night emails.

-----Original Message-----

From: PMT02 Hoc
Sent: Friday, April 01, 2011 3:40 PM
To: Jones, Cynthia; PMT11 Hoc
Subject: RE: IAEA Source Term data

Cyndi,

I just came on the shift, and I have a question about your e-mail/question below.
Which NRC source term are you concerned with? MELCOR or RASCAL?

Fritz

-----Original Message-----

From: Hoc, PMT12
Sent: Friday, April 01, 2011 2:27 PM
To: PMT09 Hoc; PMT02 Hoc
Subject: FW: IAEA Source Term data

-----Original Message-----

From: Jones, Cynthia
Sent: Friday, April 01, 2011 2:05 PM
To: Hoc, PMT12
Subject: FW: IAEA Source Term data

Did the LT (liaison team) forward to you in PMT? Suggest our dose assessors look at this and see how this comports with our estimates.....

-----Original Message-----

From: Schwartzman, Jennifer
Sent: Wednesday, March 30, 2011 8:26 AM
To: Jones, Cynthia; Cool, Donald
Subject: FW: IAEA Source Term data

FYi

-----Original Message-----

From: Shaffer, Mark R [mailto:ShafferMr@state.gov]
Sent: Wednesday, March 30, 2011 6:23 AM
To: Szymanski, John
Cc: LIA02 Hoc; LIA03 Hoc; Schwartzman, Jennifer
Subject: IAEA Source Term data

Mr. Szymanski:

I spoke with Mr. Jim Lyons, IAEA's Director for the Division of Nuclear Installation Safety, regarding your question. He provide me with the response below, as well as the attached document which summarizes the source term assumptions. Hope this helps.

-Mark

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From: J.Lyons@iaea.org [mailto:J.Lyons@iaea.org]
Sent: Wednesday, March 30, 2011 11:47 AM
To: Shaffer, Mark R
Subject: Source term for march 26 with basis .docx

Mark,

The attached estimates of the magnitude and pattern of the release of I-131, Cs-137 and Te-132 were prepared Sunday by our Tom McKenna (IAEA).

Estimates are based on the available information on ground deposition, gamma dose rates and other environmental monitoring data. This source term was provided to RSMA Montreal and CTBTO to use in the atmospheric dispersion models. Note that we are looking at what happened, not what is going to happen.

Jim

This email is UNCLASSIFIED

From: PMT02 Hoc
Sent: Friday, April 01, 2011 5:30 PM
To: Hoc, PMT12; PMT09 Hoc
Cc: PMT11 Hoc
Subject: RE: IAEA Source Term data Comparison to NRC RASCAL "Plausible Realistic" Source Term

PMT Dose Assessors compared the IAEA estimated source term provided on March 27, 2011, (total release assumed before March 18, 2011) to the NRC "Plausible Realistic" estimated source term from RASCAL of 24 March 2011.

The comparison of IAEA estimated activities to RASCAL "Plausible Realistic" estimated activities are as follows:

	<u>IAEA</u>		<u>Rascal</u>
I-131	(1.6E+5 Ci	vs	1.3E+6 Ci)
Cs-137	(1.6E+4 Ci	vs	1.4E+5 Ci)
Te-132	(1.4E+5 Ci	vs	2.0E+5 Ci)

PMT Dose Analyst (PMT02)
NRC Operation Center

-----Original Message-----

From: Hoc, PMT12
Sent: Friday, April 01, 2011 2:27 PM
To: PMT09 Hoc; PMT02 Hoc
Subject: FW: IAEA Source Term data

-----Original Message-----

From: Jones, Cynthia
Sent: Friday, April 01, 2011 2:05 PM
To: Hoc, PMT12
Subject: FW: IAEA Source Term data

Did the LT (liaison team) forward to you in PMT? Suggest our dose assessors look at this and see how this comports with our estimates.....

-----Original Message-----

From: Schwartzman, Jennifer
Sent: Wednesday, March 30, 2011 8:26 AM
To: Jones, Cynthia; Cool, Donald
Subject: FW: IAEA Source Term data

FYi

-----Original Message-----

From: Shaffer, Mark R [mailto:ShafferMr@state.gov]
Sent: Wednesday, March 30, 2011 6:23 AM
To: Szymanski, John
Cc: LIA02 Hoc; LIA03 Hoc; Schwartzman, Jennifer
Subject: IAEA Source Term data

Mr. Szymanski:

I spoke with Mr. Jim Lyons, IAEA's Director for the Division of Nuclear Installation Safety, regarding your question. He provide me with the response below, as well as the attached document which summarizes the source term assumptions. Hope this helps.

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Jim

This email is UNCLASSIFIED

From: PMT02 Hoc
Sent: Friday, April 01, 2011 4:32 PM
To: PMT11 Hoc
Subject: FW: IAEA Source Term data

FYI

-----Original Message-----

From: PMT02 Hoc
Sent: Friday, April 01, 2011 4:32 PM
To: Jones, Cynthia
Subject: RE: IAEA Source Term data

Cyndi,

Last Saturday night 03/19 the MELCOR source term was sent to NARAC.

The "Supercore - Trans-Pacific" source term from RASCAL was sent on 03/18

The "Supercore - Plausible" source term from RASCAL was sent on 03/24

The IAEA source term looks closer to the "Supercore - Plausible" RASCAL source terms - I haven't checked MELCOR yet.

Thanx,

Fritz
PMT Dose Analyst (PMT02)
NRC Operation Center

-----Original Message-----

From: Jones, Cynthia
Sent: Friday, April 01, 2011 4:08 PM
To: PMT02 Hoc
Subject: RE: IAEA Source Term data

RASCAL - See the notebook for the dose assessors and check last Sat night emails.

-----Original Message-----

From: PMT02 Hoc
Sent: Friday, April 01, 2011 3:40 PM
To: Jones, Cynthia; PMT11 Hoc
Subject: RE: IAEA Source Term data

Cyndi,

I just came on the shift, and I have a question about your e-mail/question below.
Which NRC source term are you concerned with? MELCOR or RASCAL?

KKKK-139

Fritz.

-----Original Message-----

From: Hoc, PMT12
Sent: Friday, April 01, 2011 2:27 PM
To: PMT09 Hoc; PMT02 Hoc
Subject: FW: IAEA Source Term data

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Cc: LIA02 Hoc; LIA03 Hoc; Schwartzman, Jennifer
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Jim

This email is UNCLASSIFIED

From: LIA07 Hoc
Sent: Sunday, April 03, 2011 6:15 AM
To: Batkin, Joshua; Borchardt, Bill; Bradford, Anna; Coggins, Angela; Cohen, Shari; Collins, Elmo; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Jaczko, Gregory; Johnson, Michael; Leeds, Eric; Loyd, Susan; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walker, Dwight; Walls, Lorena; Weber, Michael
Subject: Go Book Update - 0600 EDT, April 3, 2011
Attachments: USNRC Earthquake-Tsunami Update.040311 0430EDT.pdf; ET Chronology 4-3-11 0545 short.pdf; TEPCO Press Release 255.pdf; TEPCO Press Release 256.pdf; TEPCO Press Release 252.pdf; TEPCO Press Release 253.pdf; TEPCO Press Release 254.pdf

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

The updates include:

- The 0430 EDT, 04/03/11 Status Update
- The latest ET Chronology
- TEPCO Press Release (252-256)

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

Yen

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

KKKK-140

Press Releases

Press Release (Apr 03,2011)

Status of TEPCO's Facilities and its services after the Tohoku-Taiheiyou-Oki Earthquake(as of 10:00AM)

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

Below is the status of TEPCO's major facilities.

*new items are underlined

[Nuclear Power Station]

Fukushima Daiichi Nuclear Power Station:

Units 1 to 3: shutdown due to the earthquake

(Units 4 to 6: outage due to regular inspections)

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

*Off-site power has been connected to Unit 1 to 6 by March 22, 2011.

*Unit 1

- The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36pm, March 12th.
- We started injection of sea water at 8:20 pm, March 12th, and then boric acid which absorbs neutron into the reactor afterwards.
- At approximately 2:30 am, March 23rd, we started the injection of sea water into the reactor from feed water system. After that, the injection of freshwater was started from 3:37 pm on March 25th (switched from the seawater injection). At 8:32 am, Mar 29th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 10:50 am on March 24th, white smoke was confirmed arising from the top of the reactor building.
- At approximately 11:30 am, March 24th, lights in the main control room were restored.
- At approximately 5:00 pm, March 24th, draining water from underground floor of turbine buildings into a condenser was started and it was paused at approximately 7:30 am, March 29th because we confirmed that the water level reached almost full capacity of a condenser. In order to move the water in the condenser into condensate reservoirs, water transfer from the condensate reservoirs to suppression pool's water surge-tanks was conducted from around 0:00 pm, March 31st to 3:26 pm, April 2nd.
- From 1:03 pm, March 31st, the water spray by the concrete pumping vehicle was started, and finished at 4:04 pm.
- In order to confirm the position of water spray to the spent fuel pool by the concrete pumping vehicle, the water spray was conducted from 5:16 pm to 5:19 pm.

*Unit 2

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

- On March 18th, power was delivered up to substation for backup power through offsite transmission line. We completed laying cable further to unit receiving facility in the building, and at 3:46 pm, March 20th the load-side power panel of the receiving facility started to be energized.
- From 3:05 pm to 5:20 pm on March 20th, about 40 tons of seawater was injected into Unit 2 by TEPCO employees.
- At approximately 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level where we could hardly confirm.
- From around 4:00 pm to 5:00 pm on March 22nd, approximately 18 tons of sea water was injected into the spent fuel pool by TEPCO employees.
- From 10:10 am on March 26th, freshwater (with boric acid) injection was initiated. (switched from the seawater injection) At 6:31pm, March 27th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- From 10:30 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated. The work was finished at 12:19 pm, March 25th. From 4:30 pm, March 29th, freshwater injection through Fuel Pool Cooling and Filtering System was initiated. (We switched from seawater to freshwater). The work was finished at 6:25 pm on March 29th. At 9:25 am, March 30th, we started fresh water injection by a temporary motor driven pump, but we switched the pump to the fire fighting pump due to the pump trouble. At 1:10 pm, March 30th, freshwater injection was suspended, because we found the crack on a part of the hose. At 7:05 pm, March 30th, freshwater injection was resumed and finished at 11:50 pm, March 31.
- At approximately 4:46 pm, March 26th, lights in the main control room were restored.
- At approximately 4:45 pm, March 29th, the water in condensate reservoirs was being transferred to suppression pool water surge-tanks to prepare for water transfer from a condenser to condensate reservoirs in order to drain water on the underground floor of the turbine building into a condenser. At 11:50 am, April 1st, transfer was completed.
- At 14:56 pm, April 1st, water injection into spent fuel pool in Unit 2 by temporary motor driven pump was initiated. At 5:05 pm on April 1st, the water injection was finished.
- The water transfer from the condenser to the condensate reservoirs has been conducted since 5:10 pm, April 2nd.

*Unit 3

- At 6:50 am, March 14th, while water injection to the reactor was under operation (injection of boric acid was done on Mar 13th), the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in the Article 15, the Clause 1 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure gradually decreased (as of 9:05 am, 490 kPa).
- At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them were conscious) sustained injuries and were taken to the hospital by ambulances.
- As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered. However the operation on March 16th was cancelled.
- At 6:15 am, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable within a certain range. On March 20th, we were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
- In order to cool spent fuel pool, water was sprayed by helicopters on March 17th with the cooperation of Self-Defense Forces.
- At approximately past 7:00 pm, March 17th, Self-Defense Forces and the police started spraying water by water cannon trucks upon our request for the cooperation. At 8:09 pm, March 17th, they finished the operation.
- At 2:00 pm, March 18th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At 2:45 pm, March 18th, the operation was finished.
- At approximately 12:30 am, March 19th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 1:10 am, March 19th, the operation was finished. They resumed spraying water at 2:10 pm and finished at approximately 3:40 am, March 20th.
- At approximately 9:30 pm, March 20th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 3:58 am, March 21st, they the operation was finished.
- At approximately 3:55 pm, March 21st, light gray smoke was confirmed arising from the southeast side of the 5th floor roof of the Unit 3 building. The situation was reported to the fire department at approximately 4:21 pm. The parameters of reactor pressure vessel, reactor containment vessel, and monitored environmental data remained stable without significant change. However, employees working around Unit 3 evacuated to a safe location. On March 22nd, the color of smoke changed

to somewhat white and it is slowly dissipating.

- At approximately 3:10 pm on March 22nd, spraying water to Unit 3 by Tokyo Fire Department's Hyper Rescue and Osaka City Fire Department was conducted, and completed at approximately 4:00 PM on the same day.
- At approximately 10:45 pm on March 22nd, lights in the main control room were restored.
- At 11:00 am on March 23rd, the injection of sea water to spent fuel pool was conducted, and finished approximately at 1:20 pm on the same day.
- At 4:20 pm on March 23rd, light gray smoke was observed belching from Unit 3 building. The situation was reported to the fire department at 4:25 pm on March 23rd. The parameters of the reactor, the reactor containment vessel of Unit 3, and monitored figures around the site's immediate surroundings remained stable without significant change. To be safe, workers in the main control room of Unit 3 and around Unit 3 evacuated to a safe location. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, TEPCO employees confirmed the smoke has disappeared. Accordingly, workers evacuation was lifted.
- From approximately 5:35 am on March 24th, sea water injection through Fuel Pool Cooling and Filtering System was initiated, and finished at approximately 4:05 pm on the same day.
- From 1:28 pm on March 25th, Hyper Rescue team started water spray. The work finished at 4:00 pm on March 25th.
- From 6:02 pm on March 25th, the injection of freshwater to the reactor was started (switched from the seawater injection). At 8:30 pm on March 28th, the injection of fresh water is switched to temporary electricity pumps from the fire engine pumps.
- At approximately 12:34pm March 27th, the injection of water by the concrete pump truck was started. At approximately 2:36 pm, March 27th, the operation was finished.
- At approximately 2:17pm March 29th, the injection of fresh water by the concrete pump truck was started. (Sea water had been injected so far and transfer from seawater to freshwater was made). The water injection was finished at 6:18 PM, March 29th.
- At approximately 5:40 pm, March 28th, the water in condensate reservoirs was being transferred to suppression pool water surge-tanks to prepare for water transfer from a condenser to condensate reservoirs in order to drain water on the underground floor of the turbine building into a condenser. We finished the transfer work at approximately 8:40 am, March 31st.
- From 4:30 pm, March 31st, the water spray by the concrete pumping vehicle was started, and finished at 7:33 pm.
- From 9:52 am, April 2nd, the water spray by the concrete pumping vehicle was started, and finished at 0:54 pm.

*Unit 4

- At approximately 6:00 am, March 15th, an explosive sound was heard and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employees confirmed that the fire was out.
- At approximately 5:45 am on March 16th, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approximately 6:15 am, TEPCO staff confirmed at the site that there are no signs of fire.
- At approximately 8:21 am on March 20th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and they finished the operation at approximately 9:40 am. At approximately 6:45 pm spraying water was started by Self-Defenses' water cannon trucks and finished at approximately 7:45 pm.
- At approximately 6:30 am, March 21st, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At approximately 8:40 am, March 21, they had finished the operation.
- On March 21st, cabling has been completed from temporary substation to the main power center.
- From approximately 5:20 pm on March 22nd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 8:30 pm on the same day.
- From approximately 10:00 am on March 23rd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 1:00 pm on the same day.
- From approximately 2:35 pm on March 24th, spraying water by the concrete pumping vehicle was conducted and ended at approximately 5:30 pm on the same day.
- From 6:05 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated and finished at approximately 10:20 am on the same day.
- From 7:05 pm on March 25th, water spray by the concrete pumping vehicle was started and finished at 10:07 pm on March 25th.
- From 4:55 pm on March 27th, water spray by the concrete pumping vehicle was started and finished at 7:25 pm on March 27th.
- At approximately 11:50 am on March 29th, lights in the main control room were restored.
- From 2:04 pm on March 30th, water spray by the concrete pumping vehicle was started and finished at 6:33 pm on March 30th.

-From 8:28am, April 1st, the water spray by the concrete pumping vehicle was started. At 14:14 pm, the water spray finished.

*Unit 5 and 6

-At 5:00 am on March 19th, we started the Residual Heat Removal System Pump (C) of Unit 5 in order to cool the spent fuel pool. At 10:14 pm, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.

-Unit 5 has been in reactor cold shutdown since 2:30 pm on March 20th.

Unit 6 has been in reactor cold shutdown since 7:27 pm on March 20th.

-At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.

-At approximately 5:24 pm on March 23rd, the temporary Residual Heat Removal System Seawater Pump automatically stopped when its power source was switched. We restarted the pump at around 4:14 pm, March 24th, and resumed cooling of reactor at around 4:35 pm.

*On March 18th, regarding the spent fuel in the common spent fuel pool, we have confirmed that the water level of the pool is secured. At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.

*common spent fuel pool: a spent fuel pool for common use set in a separate building in a plant site in order to preserve spent fuel which are transferred from the spent fuel pool in each Unit building.

*On March 17th, we patrolled buildings for dry casks and found no signs of abnormal situation for the casks by visual observation. A detailed inspection is under preparation.

*dry cask: a measure to store spent fuel in a dry storage casks in storages. Fukushima Daiichi Nuclear Power Station started to utilize the measure from August 1995.

*On March 21st, 23rd to 30th, we detected technetium, cobalt, iodine, cesium, tellurium, barium, lanthanum and molybdenum from the seawater around the discharge canal of the station.

*On March 20th, 21st, 23rd to 30th, we detected iodine, cesium, tellurium and ruthenium in the air collected at the site of Fukushima Daiichi Nuclear Power Station.

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

*We detected radioactive materials contained in the puddles found in the turbine building of Unit 1 to 4.

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

On March 29th, we detected niobium, tellurium, ruthenium, silver, tellurium, iodine, cesium, and ruthenium in the water collected at the trench of unit 1.

On March 30th, we took samples from the water in the trench of Unit 2 and 3, and conducted nuclide analysis on them. We are now confirming the results of the analysis.

At approximately 9:30 am, April 2nd, we found that there was water in the shaft for storing power cable (concrete product) near the intake of water for Unit 2, the radioactive air dose was over 1,000mSv/h and the water spilled into the sea from the crack (approximately 20 cm) on the side of the shaft. We injected fresh concrete to the shaft twice, however, we could not observe a change in the amount of water flowing into the sea. Therefore, we considered that a new method of stopping the water and determined to use the polymeric macromolecule. Necessary equipment and experts of water shutoff will be dispatched to the site to check the condition. Tonight, they will depart from Tokyo and will start the work with survey of the site conditions tomorrow morning April 3. There is a connection point between the tunnel of unit 2 and this shaft. It was assumed that a puddle of water in the turbine building of unit 2, out flowed through this connection point and spilled into the sea from the crack of the shaft. Therefore, we will investigate out flowed route to the shaft and implement the water analysis by taking samples in the shaft near the spilling point to the sea. In addition, from April 2nd, we will implement sampling at 15km offshore Fukushima Daiichi and Fukushima Daini Nuclear Power Stations and will evaluate these samples comprehensively.

*Since around 9:20 am, March 31st, the water transfer from the vertical shaft of Unit 1 to the reservoir of the centralized environmental

facility was conducted. We finished the task around 11:25 am of the same day.

*We found a puddle of water at the main building of the centralized environmental facility process. We analyzed and detected approximately $1.2 \times 10^5 \text{Bq/cm}^3$ of radioactivity in full dose in the Controlled Area and $2.2 \times 10^5 \text{Bq/cm}^3$ in full dose in the Non-Controlled Area on March 29.

*The first barge of the U.S. Forces with fresh water to be used to cool down reactors etc. was towed by a ship of Maritime Self-Defense Force and docked at 3:42 pm on March 31st 2011. At approximately 3:58 pm, April 1st, we started to replenish filtrate tanks with the fresh water, and finished at 4:25 pm. At approximately 10:20 am, April 2nd, we resumed replenishing filtrate tanks with the fresh water, and finished at 4:40 pm. The second barge of the U.S. Forces with the fresh water towed by the ship of Maritime Self-Defense Force came alongside the pier at approximately 9:10 am, April 2nd. It is in preparation for replenishing filtrate tanks with the fresh water.

*At 11:35 am, April 1st, a worker fell into the sea while stepping into the ship from the pier during the hose laying work of the barge. Other crew immediately rescued the worker. While no injury or contamination was confirmed, whole body counter will be implemented to check the contamination inside the body just in case.

*From 3:00 pm, April 1st, we started spraying inhibitor in order to prevent diffusion of radioactive materials. This attempt was conducted on a trial basis at the mountain side area of the common spent fuel pool in the range of 200m². The spraying finished at 4:05 pm.

*Monitoring posts (no.1 to no.8) which were installed around the site boundary have been restored. We will continue monitoring the measured value and make announcements on those values accordingly.

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

Fukushima Daini Nuclear Power Station:

Units 1 to 4: shutdown due to the earthquake

*The national government has instructed evacuation for those local residents within 10km radius of the periphery.

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

*At 2:30 pm on March 30th, the power source of the residual heat removal system(B) to cool the reactor of Unit 1 was secured from an emergency power source in addition to an offsite power. This means that all the units secure backup power sources (emergency power sources) for the residual heat removal systems(B).

*(Unit 1)

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

*(Unit 4)

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

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

Kashiwazaki Kariwa Nuclear Power Station:

Units 1, 5, 6, 7: normal operation

(Units 2 to 4: outage due to regular inspection)

[Thermal Power Station]

-Hirono Thermal Power Station Units 2 and 4: shutdown due to the earthquake

-Hitachinaka Thermal Power Station Unit 1: shutdown due to the earthquake

-Kashima Thermal Power Station Units 2, 3, 5, 6: shutdown due to the earthquake

[Hydro Power Station]

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

[Transmission System, etc.]

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

[Supply and Demand Status within TEPCO's Service Area to Secure Stable Power Supply]

-Considering the critical balance of our power supply capacity and expected power demand going forward, in order to avoid unexpected blackout, TEPCO has been implementing rolling blackout (planned blackout alternates from one area to another) since March 14th. We will make our utmost to secure the stable power supply as early as possible. For customers who will be subject to rolling blackout, please be prepared for the announced blackout periods. Also for customers who are not subject to blackouts, TEPCO appreciates your continuous cooperation in reducing electricity usage by turning of unnecessary lights and electrical equipment.

[Others]

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

[☐ Back to Page Top](#)

Press Releases

Press Release (Apr 03,2011) Plant Status of Fukushima Daiichi Nuclear Power Station (as of 0:30 PM, April 3)

Updates are underlined

All 6 units of Fukushima Daiichi Nuclear Power Station have been shut down.

Unit 1(Shut down)

- Explosive sound and white smoke were confirmed after the big quake occurred at 3:36 pm on March 12th. It was assumed to be hydrogen explosion.
- At approximately 2:30 am on March 23rd, seawater injection to the nuclear reactor through the feed water system was initiated.
- At approximately 10:50 am on March 24th, white fog-like steam arising from the roof part of the reactor building was observed.
- We had been injecting seawater into the reactor, but from 3:37 pm on March 25th, we started injecting freshwater.
- We had been injecting fresh water to the reactor using fire engines; however we switched over utilizing temporary electrical pump at 8:32 am on March 29th.
- Some of turbine building lights were turned on April 2nd.
- We injected fresh water to the reactor by a temporary motor driven pump, but, from 10:42am to 11:52am on April 3rd we temporarily switched the pump to the fire fighting pump to inject fresh water to use power through off-site transmission line. We're now injecting fresh water to the reactor by a motor driven pump powered by off-site transmission line.

Unit 2(Shut down)

- At approximately 6:00 am on March 15th, an abnormal noise began emanating from nearby Pressure Suppression Chamber and the pressure within the chamber decreased.
- We have been injecting seawater into the reactor, but from 10:10 am on March 26th, we started injecting freshwater (with boric acid).
- We had been injecting fresh water in to the reactor utilizing fire pump, however, we switched over to utilizing temporary electrical pump from 6:31 pm on March 27th.
- Some of turbine building lights were turned on April 2nd.
- We injected fresh water to the reactor by a temporary motor driven pump, but, from 10:22am to 0:06pm on April 3rd, we temporarily switched the pump to the fire fighting pump to inject fresh water to use power through off-site transmission line. We're now injecting fresh water to the reactor by a motor driven pump powered by off-site transmission line.

Unit 3(Shut down)

- Explosive sound and white smoke were confirmed at 11:01am March 14th. It was assumed to be hydrogen explosion.
- We had been injecting seawater into the reactor pressure vessel, but from 6:02 pm on March 25th, we started injecting freshwater.
- We had been injecting fresh water in to the reactor utilizing fire pump, however, we switched over to utilizing temporary electrical pump from 8:30 pm on March 28th.
- Some of turbine building lights were turned on April 2nd.
- We injected fresh water to the reactor by a temporary motor driven pump, but, from 10:03am to 0:16pm on April 3rd, we temporarily switched the pump to the fire fighting pump to inject fresh water to use power through off-site transmission line. We're now injecting fresh water to the reactor by a motor driven pump powered by off-site transmission line.

Unit 4(outage due to regular inspection)

- At approximately 6 am on March 15th, we confirmed the explosive sound and the sustained damage around the 5th floor rooftop area of the Nuclear Reactor Building.
- Some of turbine building lights were turned on April 2nd.

-At this moment, we do not consider any reactor coolant leakage inside the reactor happened.

Unit 5(outage due to regular inspection)

-Sufficient level of reactor coolant to ensure safety is maintained.
 -At 5 am, March 19th, we started the Residual Heat Removal System Pump (C) in order to cool the spent fuel pool.
 -At 2:30 pm, March 20th, the reactor achieved reactor cold shutdown. At around 5:24 pm on March 23rd, when we switched the temporary Residual Heat Removal System Seawater Pump, it has stopped automatically. At around 4:14 pm, March 24th we replaced the pump, and restarted cooling of reactor at around 4:35 pm.
 -At this moment, we do not consider any reactor coolant leakage inside the reactor happened.

Unit 6(outage due to regular inspection)

-Sufficient level of reactor coolant to ensure safety is maintained.
 -At 10:14 pm, March 19th, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
 -At 7:27 pm, March 20th, the reactor achieved reactor cold shutdown.
 -In relation to the two seawater side pumps of the Residual Heat Removal System, we switched the power source from temporary to permanent at 3:38 PM and 3:42PM, Mar 25 respectively.
 -At this moment, we do not consider any reactor coolant leakage inside the reactor happened.

Today's work for cooling the spent fuel pools

-Water spray by the concrete pump truck to Unit 3 started at 9:53 am and continued until 0:54 pm.
 -Water spray by the concrete pump truck to Unit 1 started at 5:16 pm and continued until 5:19 pm.
 -We are considering further spraying subject to the conditions of spent fuel pools.

Draining water from underground floor of turbine buildings

-In regard with transferring water from a condensate storage tank to a suppression pool water surge-tank in unit 1, work began at 0:00 pm March 31st and continued until around 3:30 pm on April 2nd.
 -Water transfer from a condenser to a condensate storage tank in unit 2, began at approximately 5:10 pm, April 2nd.

Casualties

-Presence of 2 TEPCO employees at the site is not confirmed on March 11th.
 -On March 24th, it was confirmed that 3 workers from cooperative companies who were in charge of cable laying work in the 1st floor and the underground floor of turbine building were exposed to the radiation dose of more than 170 mSv. 2 of them were confirmed that their skins on legs were contaminated. After they were decontaminated, since there was a possibility of beta ray burn injury, they were transferred to Fukushima Medical University Hospital. The third worker was also transferred to Fukushima Medical University Hospital on March 25th. Later, the 3 workers were transferred to National Institute of Radiological Sciences in Chiba Prefecture. They all left the hospital on March 28th.
 Regarding this event, TEPCO has reported to the related government ministries and agencies on measures to be taken to assure appropriate radiation dose control and radiation exposure related operations. We will inform the related parties of countermeasures and continue to take all possible measures to future management.

Others

-We measured radioactive materials (iodine etc.) inside of the nuclear power station area (outdoor) by monitoring car and confirmed that radioactive materials level is getting higher than ordinary level. As listed below, we have determined that specific incidents stipulated in article 15, clause 1 of Act on Special Measures Concerning Nuclear Emergency Preparedness (Abnormal increase in radiation dose measured at site boundary) have occurred.

- Determined at 4:17 pm Mar 12th (Around Monitoring Post 4)
- Determined at 8:56 am Mar 13th (Around Monitoring Post 4)
- Determined at 2:15 pm Mar 13th (Around Monitoring Post 4)
- Determined at 3:50 am Mar 14th (Around Monitoring Post 6)
- Determined at 4:15 am Mar 14th (Around Monitoring Post 2)
- Determined at 9:27 am Mar 14th (Around Monitoring Post 3)
- Determined at 9:37 pm Mar 14th (Around main entrance)
- Determined at 6:51 am Mar 15th (Around main entrance)
- Determined at 8:11 am Mar 15th (Around main entrance)
- Determined at 4:17 pm Mar 15th (Around main entrance)
- Determined at 11:05 pm Mar 15th (Around main entrance)
- Determined at 8:58 am Mar 19th (Around MP5)

From now on, if the measured figure fluctuates and goes above and below 500 micro Sv/h, we deem that as the continuous same event and will not regard that as a new specific incidents stipulated in article 15, clause 1 of the Act on Special Measures Concerning Nuclear Emergency Preparedness (Abnormal increase in radiation dose measured at site boundary) has occurred. In the interim, if we measure a manifestly

abnormal figure and it is evident that the event is not the continuous same event, we will determine and notify.

- The national government has instructed evacuation for those local residents within 20km radius of the periphery and evacuation to inside for those residents from 20km to 30km radius of the periphery, because it is possible that radioactive materials are discharged.
- At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm (conducted by TEPCO).
- At around 3:37 pm, March 24th, electricity supply to common spent fuel pool has started from external power source. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
- We found no signs of abnormal situation for the casks by visual observation during the patrol activity. A detailed inspection is under preparation.
- At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
- In total 12 fire engines are lent for the water spraying to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided by Niigata City Fire Headquarter and Hamamatsu City Fire Headquarter.
- *:Koriyama Fire Department, Iwaki Fire Brigade Headquarters, Fire Headquarters of Sukagawa District Wide Area Fire-fighting Association, Yonezawa City Fire Headquarters, Utsunomiya City Fire Headquarters, Fire Headquarters of Aizu-Wakamatsu wide area municipal association, Saitama City Fire Bureau, and Niigata City Fire Bureau.
- By March 22nd, Units 1 through 6 were started to be energized from the external power source.
- At around 11:35 am April 1st, a worker fell into the sea when he got into a barge of the U.S. Forces to repair a hose of the ship. The worker was rescued immediately, and was not injured and not contaminated. The worker will be checked using the whole-body counter to ensure his health.
- The second barge of the U.S. Forces with freshwater to be used to cool down the reactors etc. was towed by a ship of Maritime Self-Defense Force and came alongside the pier at 9:10 am on April 2nd. We began to replenish the filtrate tanks with water of a barge (the first barge) at around 10:20 am on April 2nd and continued until 4:40 pm.
- We began to transfer fresh water from the second barge to the first barge on April 3rd at 9:52 am and continued until 11:15 am on April 3rd.
- We also began to transfer the radioactive water we collected from the building of Radioactive Waste Treatment Facilities to the Unit 4 turbine building.
- Monitoring posts of No. 1 No.8 set up near the boundary of power station area have been restored. We will periodically monitor the data and announce the results of monitoring.
- We will continue to take all measures to ensure the safety and to continue monitoring the surrounding environment around the Power Station.

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Press Releases

Press Release (Apr 03, 2011)

Employees of TEPCO Who Were Missing at Fukushima Daiichi Nuclear Power Station

Due to the Tohoku-Taiheiyou-Oki Earthquake which occurred on March 11th 2011, two TEPCO employees, who had been working at the turbine building of Unit 4 for site investigation, went missing. We had put all our strengths to search them, and approximately at 3:25 pm and at 3:53 pm, today, March 30th, 2011, those employees were found at the basement of the turbine building and we confirmed their death yesterday. We would like to offer our deep regret that our workers died while working at the plant and heartfelt condolences to the bereaved families.

[Deceased Employees of TEPCO]

Kazuhiko Kokubo (Age: 24) Operation Management Department One, Fukushima Daiichi Nuclear Power Station
Yoshiki Terashima (Age: 21) Operation Management Department One, Fukushima Daiichi Nuclear Power Station

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Press Releases

Press Release (Apr 03,2011)

Plant Status of Fukushima Daini Nuclear Power Station (as of 4:00 pm April 3rd)

[No particular update from the previous release (as of 4:00 pm April 2nd)]

Unit Status

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

Other No particular update

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 Search

Press Releases

Press Release (Apr 03,2011) (Comment)Employees of TEPCO Who Were Missing at Fukushima Daiichi Nuclear Power Station

April 3, 2011
Tokyo Electric Power Company
Tsunehisa Katsumata, Chairman

It is the most regrettable fact that we lost two young employees who were working to protect the safety of the Fukushima power station after the earthquake and the tsunami. I would like to offer my deep sorrow that these men died and heartfelt condolences to the bereaved families. We will work to avoid a similar tragedy in the future, and will put all our strength and all our hearts to improve the situation after the incident at Fukushima Daiichi Nuclear Power Station.

May their spirits rest in peace.

[Back to page top](#)

From: LIA07 Hoc
Sent: Sunday, April 03, 2011 5:50 PM
Subject: 1800 EDT (April 3, 2011) USNRC Earthquake/Tsunami Status Update
Attachments: NRC Status Update 04.03.11--1800EDT.pdf

Attached, please find a 1800 EDT, April 3, 2011 status update from the US Nuclear Regulatory Commission's Emergency Operations Center regarding the impacts of the earthquake/tsunami.

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

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

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

KKKK-141

From: ET02 Hoc
Sent: Wednesday, April 06, 2011 10:12 AM
To: ET07 Hoc
Subject: FW:

From: McGinty, Tim
Sent: Wednesday, April 06, 2011 9:27 AM
To: ET02 Hoc
Subject:

<http://energycommerce.house.gov/news/PRArticle.aspx?NewsID=8438>

KKKK-142

From: ET07 Hoc
Sent: Wednesday, April 06, 2011 2:57 PM
To: Casto, Chuck; Collins, Elmo; Blamey, Alan; Dorman, Dan
Subject: Call the ET when your team wakes up

Importance: High

We've had a bit of media interest today from the NYT article (link below). Reuters also printed a statement by M. Virgilio (the other link).

Call the ET when you are up if they haven't called you already. You'll want to touch base with the ET before you get to the Embassy.

http://www.nytimes.com/2011/04/06/world/asia/06nuclear.html?_r=2&hp

<http://ca.news.yahoo.com/japan-no-2-core-melted-reactor-vessel-rep-20110406-074109-708.html>

From: LIA06 Hoc
Sent: Wednesday, April 06, 2011 3:40 PM
To: RMTPACTSU_ELNRC
Subject: RE: THANKS -- RE: Possible SHORT-TERM ACTION (Due COB Today) -- Draft Q&A for Ambassador Roos
Attachments: image001.png

My pleasure Kiddo!

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

From: RMTPACTSU_ELNRC [mailto:RMTPACTSU_ELNRC@ofda.gov]
Sent: Wednesday, April 06, 2011 3:38 PM
To: LIA06 Hoc
Cc: LIA01 Hoc; LIA08 Hoc; LIA11 Hoc
Subject: THANKS -- RE: Possible SHORT-TERM ACTION (Due COB Today) -- Draft Q&A for Ambassador Roos

Thanks a million for your prompt reply! ☺

Cheers,
Leigh

From: LIA06 Hoc [mailto:LIA06.Hoc@nrc.gov]
Sent: Wednesday, April 06, 2011 3:37 PM
To: RMTPACTSU_ELNRC
Cc: LIA01 Hoc; LIA08 Hoc
Subject: RE: Possible SHORT-TERM ACTION (Due COB Today) -- Draft Q&A for Ambassador Roos

NRC is good to go on the talking points.

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

From: LIA01 Hoc
Sent: Wednesday, April 06, 2011 3:25 PM
To: LIA08 Hoc; LIA06 Hoc
Subject: FW: Possible SHORT-TERM ACTION (Due COB Today) -- Draft Q&A for Ambassador Roos

Fyi

From: RMTPACTSU_ELNRC [mailto:RMTPACTSU_ELNRC@ofda.gov]
Sent: Wednesday, April 06, 2011 2:07 PM
To: LIA01 Hoc; LIA11 Hoc; LIA02 Hoc; LIA03 Hoc

KKKK-1414

Cc: Kozal, Jason

Subject: Possible SHORT-TERM ACTION (Due COB Today) -- Draft Q&A for Ambassador Roos

Hi there,

USAID has prepared the attached DRAFT Q&As for Ambassador Roos, and the NRC has been given an opportunity to comment. Please let me know if you would like to provide any comments.

Cheers,
Leigh

From: RMTPACTSU_INC
Sent: Wednesday, April 06, 2011 1:47 PM
To: RMTPACTSU_ELNRC
Cc: RMTPACTSU_RM
Subject: FW: PLEASE CLEAR BY COB: Draft Q&A for Ambassador Roos

Leigh,

FYI, we've received this for review. Hopefully your operations center has directly too. I'm having a look now but if you want to make any essential edits as part of the RMT approval process, please let me know.

Regards,

Lily

From: Gustafson, Rebecca (DCHA/OFDA) [mailto:rgustafson@USAID.GOV]
Sent: Wednesday, April 06, 2011 1:16 PM
To: RMTPACTSU_RM
Cc: RMTPACTSU_INC
Subject: FW: PLEASE CLEAR BY COB: Draft Q&A for Ambassador Roos

Made some edits. You guys have any more? (Could you also make sure that the NRC and HHS peeps are seeing these on their end?)

THANKS!

RG

From: Jackson, Gina (LPA/AA)
Sent: Wednesday, April 06, 2011 12:26 PM
To: Gustafson, Rebecca (DCHA/OFDA)
Subject: FW: PLEASE CLEAR BY COB: Draft Q&A for Ambassador Roos

Any issues here?
Thanks,
Gina

Gina Jackson
USAID Press Office
1300 Pennsylvania Ave N.W.
Washington D.C. 20523

phone: (202) 712-1917

fax: (202) 216-3034



USAID
FROM THE AMERICAN PEOPLE

From: McKellogg, Kelly E

Sent: Wednesday, April 06, 2011 12:03 PM

To: PA Japan; HullRyde, Leslie CDR OSD PA; Jackson, Gina (LPA/AA); Jensen, Robert R.; Hayden, Caitlin M; Petrovich, Peggy L; CAPRESSREQUESTS; robert.ditchey@osd.mil; almarrah.belk@osd.mil

Cc: EAP-P-Office-DL

Subject: PLEASE CLEAR BY COB: Draft Q&A for Ambassador Roos

All,

Please clear the attached Q&A for use by Amb. Roos in his media engagements next week. Please send us your edits by COB.

Bob and Caitlin – if you feel other agencies should clear this, will you please help us direct this to the right folks?

Thanks,

Kelly McKellogg

Bureau of East Asian and Pacific Affairs

Office of Public Affairs (EAP/P)

202-647-1028

SBU

This email is UNCLASSIFIED.

From: Quade, Christopher P

Sent: Wednesday, April 06, 2011 6:56 AM

To: PA Japan

Subject: Draft Q&A for Ambassador Roos

All,

For your review and clearance, attached please find the draft Q&A document for Ambassador Roos's upcoming (but still TBC) media engagements. As Leslie mentioned in her e-mail, the first such engagement will likely not take place until early next week.

These are the top line messages for the Ambassador to use in his interviews, but they might also be useful for Washington press guidance.

Many thanks,
Christopher

Christopher P. Quade

Deputy Press Attaché
U.S. Embassy Tokyo
米国大使館報道室
Office: 81-3-3224-5300
<http://tokyo.usembassy.gov>

This email is UNCLASSIFIED.

From: LIA06 Hoc
Sent: Wednesday, April 06, 2011 3:36 PM
To: Harrington, Holly
Cc: Burnell, Scott
Subject: RE: Possible SHORT-TERM ACTION (Due COB Today) -- Draft Q&A for Ambassador Roos
Attachments: image001.png

Thank you for the super-quick turnaround!

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

From: Harrington, Holly
Sent: Wednesday, April 06, 2011 3:34 PM
To: LIA06 Hoc
Cc: Burnell, Scott
Subject: RE: Possible SHORT-TERM ACTION (Due COB Today) -- Draft Q&A for Ambassador Roos

OPA is fine with these.

From: LIA06 Hoc
Sent: Wednesday, April 06, 2011 3:31 PM
To: Harrington, Holly
Subject: FW: Possible SHORT-TERM ACTION (Due COB Today) -- Draft Q&A for Ambassador Roos

Sorry, forgot to cc you.

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

From: LIA06 Hoc
Sent: Wednesday, April 06, 2011 3:31 PM
To: OPA Resource; Burnell, Scott
Cc: ET01 Hoc; ET05 Hoc; LIA08 Hoc
Subject: FW: Possible SHORT-TERM ACTION (Due COB Today) -- Draft Q&A for Ambassador Roos

Have you all seen these yet and have we sent comments back?

Thanks,

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

KKKK-145

From: LIA01 Hoc
Sent: Wednesday, April 06, 2011 3:25 PM
To: LIA08 Hoc; LIA06 Hoc
Subject: FW: Possible SHORT-TERM ACTION (Due COB Today) -- Draft Q&A for Ambassador Roos

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phone: (202) 712-1917
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Cc: EAP-P-Office-DL
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Bureau of East Asian and Pacific Affairs
Office of Public Affairs (EAP/P)
202-647-1028

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Many thanks,
Christopher

Christopher P. Quade
Deputy Press Attaché
U.S. Embassy Tokyo
米国大使館報道室
Office: 81-3-3224-5300
<http://tokyo.usembassy.gov>

This email is UNCLASSIFIED.

California State Senate

SENATOR ELLEN M. CORBETT

MAJORITY LEADER

REPRESENTING ALAMEDA AND SANTA CLARA COUNTIES



April 6, 2011

Gregory B. Jaczko, Chairman
United States Nuclear Regulatory Commission
Mail Stop O-16G4
Washington, DC 20555-0001

Dear Chairman Jaczko:

On Monday, March 21, 2011, the California State Senate Select Committee on Earthquake and Disaster Preparedness, Response and Recovery held a hearing entitled, "The Japan Earthquake: The Impact and Lessons for California."

At this hearing we heard testimony that the Nuclear Regulatory Commission (NRC) does not include seismicity in the scope of review for relicensing nuclear power plants. As members of this committee, we are respectfully seeking an explanation as to why seismicity is not included in these reviews and requesting that the Commission consider the recommendations in the enclosed report of the California Energy Commission when conducting the safety review requested by President Obama.

In July 2007, a magnitude 6.8 earthquake in Japan rocked the Kashiwazaki Nuclear Power Plant, the largest nuclear plant in the world. The plant experienced ground motion nearly twice that which was anticipated when the plant was designed, resulting in minor radioactive leaks. The plant was immediately shut down and remained offline for two years. The cost resulting from this loss of power totals more than \$12 billion: \$6 billion in replacement fuel costs and \$6 billion in economic impacts. On March 11, the 9.0 magnitude Tohoku earthquake and related tsunami caused serious and life threatening damage to six nuclear reactors in Japan. Radiation has been emitted from the Fukushima Dai-ichi nuclear plant and there are still problems cooling the reactors and spent fuel.

After Japan, California is one of the most seismically active areas in the world to house Nuclear Power Plants. In fact your Commission has reported that the California nuclear plants are the only ones in the nation that are located in the "highest seismic hazard areas".

At Diablo Canyon Nuclear Power Plant there are two earthquake faults, the Hosgri fault and the newly discovered Shoreline fault. The Cristianitos fault is located in close proximity to

4/13...To EDO to Prepare Response for Chairman's Signature..Date due:
May 6 .Cpy to: RF, SECY to Ack..11-0219 Chairman's Correspondence

KKKK-146

Chairman Gregory B. Jaczko
April 6, 2011
Page 2

the San Onofre Nuclear Generating Station. It is clear that seismic activity must be taken into account to ensure our nuclear power plants are safe.

California is at a critical moment in its nuclear history. The NRC is currently reviewing an application from Pacific Gas & Electric to relicense Units 1 and 2 at Diablo Canyon Nuclear Power Plant. Current licenses expire in 2024 and 2025 respectively. Southern California Edison is expected to submit a license renewal application for Units 2 and 3 at San Onofre Nuclear Generating Station in 2012. The current licenses expire in 2022.

When California reactors were permitted in the late 1960's, little was known about offshore seismic faults. In fact, the NRC did not require either SCE or PG&E to look for active faults lying under our coastal waters. By the time San Onofre and Diablo Canyon applied for rate recovery there was one known active fault offshore at each reactor's site and cost overruns to meet revised NRC standards were over \$4 billion.

In 2008 the California Energy Commission report, required by Assembly Bill 1632, presented very clear warnings of potential seismic threats for both of California's nuclear plants. The report found that the San Onofre plant could experience "large and more frequent earthquakes than the maximum 7.0 magnitude earthquake predicted when the plant was designed."

In November 2008, the U.S. Geological Service discovered a previously unknown significant fault potentially running directly underneath Diablo Canyon Nuclear Power Plant. This new fault represents the second active fault in the immediate vicinity of the plant. The characteristics of the new fault, as well as its relationship with the first fault, are largely unknown as detailed seismic studies have yet to be completed. In particular, it is unclear if the Shoreline Fault intersects the Hosgri Fault, which is also located offshore of Diablo Canyon. An intersection of the faults could significantly alter previously held assumptions about potential seismic activity and the threat to Diablo Canyon Nuclear Power Plant.

In light of the recent tragedy in Japan and much of the evidence about the seismic issues surrounding California's nuclear power plants, we the undersigned respectfully request the NRC take all necessary steps possible to protect California by ensuring the safety of our nuclear power plants.

We greatly appreciate your consideration of this request and look forward to your response.

Sincerely,



ELLEN M. CORBETT, Chair
Senate Select Committee on
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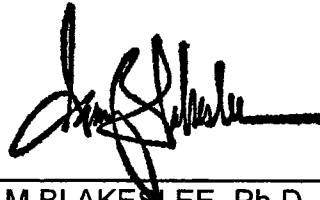


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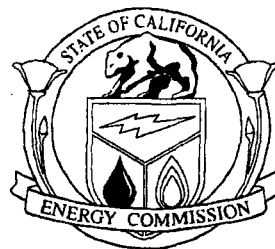
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CALIFORNIA ENERGY
COMMISSION

**AN ASSESSMENT OF CALIFORNIA'S
NUCLEAR POWER PLANTS:
AB 1632 REPORT**

COMMISSION REPORT

NOVEMBER 2008
CEC-100-2008-009-CMF



Arnold Schwarzenegger, Governor

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ABSTRACT

The report *An Assessment of California's Nuclear Power Plants: AB 1632 Committee Report* was prepared in response to Assembly Bill 1632 (Blakeslee, Chapter 722, Statutes of 2006). The bill directs the California Energy Commission to assess the potential vulnerability of California's largest baseload power plants, Diablo Canyon Power Plant and San Onofre Nuclear Generating Station, to a major disruption due to a seismic event or plant aging; to assess the impacts of such a disruption on system reliability, public safety, and the economy; to assess the costs and impacts from nuclear waste accumulating at these plants; and to evaluate other major issues related to the future role of these plants in the state's energy portfolio. The AB 1632 assessment will be included in the California Energy Commission's *2008 Integrated Energy Policy Report Update*, which is scheduled for adoption in November 2008.

The report provides findings and policy recommendations resulting from the AB 1632 assessment. It considers the seismic vulnerabilities of the nuclear plant sites, structures, and spent fuel storage facilities and the vulnerability of the plants to age-related degradation. The report also considers the impacts of a major disruption at these plants on the reliability of California's transmission grid and power supply. Finally, the report considers a number of policy areas related to California's operating nuclear power plants, including the cost, land use, and local economic impacts of nuclear waste accumulation at the plant sites; the economic and environmental tradeoffs among alternative power supply options; and potential implications of renewing the operating licenses of these plants.

Key Words

Nuclear power plants, Diablo Canyon, San Onofre Nuclear Generating Station, SONGS, Hosgri Fault, seismic, earthquake, tsunami, safe shutdown earthquake, design basis, Kashiwazaki-Kariwa, Nuclear Regulatory Commission, NRC, nuclear waste, nuclear waste storage, nuclear waste disposal, nuclear waste transport, Department of Energy, DOE, spent fuel, safety culture, transmission, production simulation, replacement power, low-level waste, renewable energy, once-through cooling, plant license renewal, relicensing, electricity, dry cask, greenhouse gas emissions, GHG emissions

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EXECUTIVE SUMMARY

Assembly Bill 1632 (Blakeslee, Chapter 722, Statutes of 2006) directs the California Energy Commission (Energy Commission) to assess the potential vulnerability of California's largest baseload power plants, which are California's two operating commercial nuclear power plants, to a major disruption due to seismic event or plant aging.¹ The Energy Commission is directed to adopt this assessment on or before November 1, 2008, and include it in the *2008 Integrated Energy Policy Report Update (2008 IEPR Update)*. The legislation also directs the Energy Commission to assess the impacts that such a disruption would have on California's energy system reliability, public safety, and the economy; assess the costs and impacts from nuclear waste accumulating at these plants; and evaluate other major policy and planning issues affecting the future role of these plants in the state's energy portfolio. AB 1632 also requires updates of the seismic vulnerability assessment to be performed as part of future *Integrated Energy Policy Reports* and that these updates take into account new data or new understandings of seismic hazards for these plants.

The state's two operating commercial nuclear power plants, Pacific Gas & Electric's (PG&E) Diablo Canyon Power Plant (Diablo Canyon) and Southern California Edison's (SCE) San Onofre Nuclear Generating Station (SONGS), account for 12 percent of the state's overall electricity supply and, by some measures, 24 percent of the state's low-carbon electricity supply.² Because California's operating nuclear power plants are important to the state's electricity supply, California needs a long-term plan to prevent or significantly reduce the chances of major disruptions and to be prepared should a disruption occur or should one or both of the plants be shut down, such as from regulatory actions following a major event at one plant that leads to a general plant shut down for an indefinite period. Both plants have achieved very high average annual capacity factors in recent years, making them reliable sources of power for the state. With California's current population exceeding 37 million and projected to grow to more than 44 million by 2020, California's electric supply infrastructure will be strained further to meet the state's increasing demand for electricity.

Recent tightening in the credit markets increases the uncertainty regarding the financial viability of new energy projects. A major disruption of California's operating nuclear plants could result in a shutdown of plant operations for several months to more than a year or even cause the retirement of one or more of the plants' reactors. Without license renewals, the plants will be permanently retired at the conclusion of their current operating licenses in the early to mid 2020s.

¹ AB 1632 directs the Energy Commission to assess "large baseload generation facilities of 1,700 megawatts or greater." Besides Diablo Canyon and SONGS, there are two generating facilities (Alamitos and Moss Landing) that have a nameplate capacity greater than 1,700 MW. However, because both of these facilities operate below a 60 percent capacity factor, they are not considered baseload generation and were excluded from the study.

² California Energy Commission. "2007 Net System Power Report." CEC-200-2008-002-CMF. April 2008, pages 4-5. <<http://www.energy.ca.gov/2008publications/CEC-200-2008-002/CEC-200-2008-002-CMF.PDF>>.

Study Team did not meet with the nuclear plant owners or other interested parties on the AB 1632 assessment. The plant owners, members of the public and interested stakeholders were provided the opportunity to submit written comments and participate in a public workshop on December 12, 2007, on the proposed study plan and submitted written comments and participated in a public workshop on September 25, 2008, on the Draft Consultant Report.⁴ A second public workshop to receive comments on this Draft Committee Report was held October 20, 2008 and written comments on this report were received through October 22, 2008. This Final Committee Report is planned for release on October 30, 2008, and the Energy Commission will consider adopting the AB 1632 Committee Report as part of the *2008 Integrated Policy Report Update* at the Energy Commission's Business Meeting on November 19, 2008.

The Committee's major findings and recommendations from this analysis are provided below and are organized into the following major study areas: Seismic Vulnerability, Vulnerability to Plant-Aging Related Degradation, Impacts of a Major Disruption, Economic, Environmental and Policy Issues, Nuclear Waste Accumulation, Land Use and Economic Implications of On-Site Waste Storage, Power Generation Options, and License Renewal Issues for State Policymakers.

SEISMIC VULNERABILITY

According to the California Seismic Safety Commission staff, there is a risk of a major earthquake in California on the order of 2 to 3 percent per year. According to the 2007 Working Group on Earthquake Probabilities, California faces a 99.7 percent chance of a magnitude 6.7 or larger earthquake during the next 30 years. The likelihood of an even more powerful quake of magnitude 7.5 or greater in the next 30 years is 46 percent.

The seismic vulnerability assessment consists of three parts: 1) an assessment of the geology and seismic hazards in the vicinity of Diablo Canyon and SONGS, 2) an assessment of the seismic design of the power plants, and 3) an assessment of the seismic and other vulnerabilities of the spent fuel storage facilities located at the plants, and of the transmission systems leading to and from the plants, and the access roadways for the plants.

Seismic Hazards at Diablo Canyon

The offshore Hosgri Fault zone, 4.5 kilometers west of Diablo Canyon, creates the primary seismic hazard at the plant site (Figure 1). Over the years there has been uncertainty regarding the tectonic setting of this fault zone, and the characterization of the Hosgri Fault as either a lateral strike-slip fault or as a thrust fault (Figure 2). The distinction is significant for the ground motion hazard at the Diablo Canyon site: a strike-slip fault is steeply (i.e. close to vertically) inclined, and a thrust fault has a shallower angle and extends diagonally beneath the surface. If the Hosgri Fault were a thrust fault with an eastward dip, the fault would extend closer to the Diablo Canyon site, and the ground motion from an earthquake could be greater.

⁴ Copies of stakeholder comments may be viewed on the Energy Commission's web site at: <http://www.energy.ca.gov/ab1632/index.html>

Current published geologic and seismologic research literature, much of which has been developed through PG&E's Long-Term Seismic Program (LTSP),⁵ supports the interpretation that the Hosgri Fault is predominantly characterized by strike-slip faulting. Experts with the U.S. Geological Survey (USGS), the California Geological Survey, and the Southern California Earthquake Center have accepted the strike-slip characterization for the Hosgri Fault. However, a minority of scientists disagrees with this characterization and believes that the Hosgri Fault is a thrust fault.

The implications of a thrust fault characterization for the seismic vulnerability of Diablo Canyon are uncertain. PG&E and the NRC separately evaluated the seismic hazard at Diablo Canyon from the Hosgri Fault assuming up to 33 percent thrust faulting. They found that there was sufficient safety margin in the plant design to accommodate the resulting ground motion from the Hosgri Fault under this assumption,, even though this motion was greater than had been anticipated when the plant was designed. PG&E has not published an analysis showing the implications of 100 percent thrust faulting on the safety of the plant, and such an interpretation is extreme in the context of the current professional consensus.

Another potential seismic hazard at Diablo Canyon occurs from the possibility of an earthquake directly beneath the plant. Based on seismologic interpretations and conclusions from investigations of the 2003 San Simeon earthquake (magnitude 6.5) that occurred approximately 35 miles north of the Diablo Canyon site, the tectonic (geologic plate) setting where this earthquake occurred appears similar to the local tectonic setting of Diablo Canyon. The deep geometry of faults that bound the San Luis-Pismo structural block, where Diablo Canyon sits, is not understood sufficiently to rule out a San Simeon-type earthquake directly beneath the plant. It is necessary to better define the deep geometry of bounding faults of the San Luis-Pismo block and to better understand the lateral continuity of these fault zones. Although these fault zones are unlikely to replace the Hosgri Fault as the dominant source of seismic hazard at the plant, improved characterizations of these fault zones would refine estimates of the ground motion that is likely to occur at different frequencies. This information may be significant for engineering vulnerability assessments.

The Diablo Canyon seismic setting has been extensively studied, largely under PG&E's Long Term Seismic Program (LTSP), and PG&E continues to study it. Further study using advanced technology may help resolve remaining uncertainties. For example, high quality three-dimensional geophysical seismic reflection mapping could resolve questions about the characterization of the Hosgri Fault and might change estimates of the seismic hazard at the plant. Similarly, direct imaging of the subsurface structure at Diablo Canyon could determine if faults exist near the site that do not break to the surface and could also serve to refine knowledge of the deep geometry, continuity, and interaction of poorly expressed faults that comprise the structural boundaries of the San Luis-Pismo Block. A permanent global

⁵ The Long-Term Seismic Program is a unique program developed in response to the discovery of the Hosgri Fault during the licensing of Diablo Canyon.

- PG&E should assess the implications of a San Simeon-type earthquake beneath Diablo Canyon.⁶ This assessment should include expected ground motions and vulnerability assessments for safety-related and non safety-related plant systems and components that might be sensitive to long-period motions in the near field of an earthquake rupture.
- The Energy Commission, in cooperation with other appropriate state agencies, should consider the relevance of the USGS National Seismic Hazard Mapping Project models and the UCERF-2 database in the context of studies required as part of the license renewal feasibility assessment at Diablo Canyon for the CPUC. Updated seismic hazard analyses incorporating these inputs would provide additional information for regulators and the public regarding the seismic hazard at the plant site.

Seismic Hazards at SONGS

Seismologic and geologic data that have become available since SONGS was built indicate that the SONGS site could experience larger and more frequent earthquakes than had been anticipated when the plant was designed. For example, underground ("blind thrust") faults in the vicinity of SONGS have been postulated since the plant was built, and the estimated frequency of a design basis ("safe shutdown") earthquake at the plant increased from 1 in 7,194 years in a 1995 study to 1 in 5,747 years in a 2001 study. A recent review by the California Coastal Commission in connection with the construction of a proposed spent fuel storage facility states, "there is credible reason to believe that the design basis earthquake approved by U.S. Nuclear Regulatory Commission (NRC) at the time of the licensing of SONGS 2 and 3 ... may underestimate the seismic risk at the site."

This new information does not necessarily imply that the facility is unsafe. Since the plant was engineered with a large margin of safety, it likely would withstand earthquakes of greater magnitude and frequency than originally expected. However, the possibility that the safety margin is shrinking suggests that further study is necessary to characterize the seismic hazard at the site, especially since much less is known about the seismic setting of SONGS than the seismic setting of Diablo Canyon. While SCE periodically evaluates the implications of new seismic data that become available, there is no ongoing program at SONGS similar to PG&E's Long-Term Seismic Program at Diablo Canyon.

The major uncertainties regarding the seismology of the SONGS site relate to the continuity, structure, and earthquake potential of a nearby offshore fault zone (the South Coast Offshore Fault Zone) and the faulting that connects faults in the Los Angeles and San Diego regions. There is also uncertainty regarding the potential for blind thrust faults near the plant. Well planned, high-quality three-dimensional seismic reflection data at strategically chosen locations

⁶ PG&E has considered a San Simeon-type earthquake scenario within probabilistic seismic hazard assessments for Diablo Canyon. However, further studies that consider such an earthquake from a deterministic basis (i.e., using a probability of 1) are recommended to evaluate the full implications of this earthquake, particularly for non-safety related plant components and reliability.

hazard of SONGS. When SCE incorporated some of these developments into the seismic hazard assessment for SONGS, SCE found that the safety margins at the plant are less than previously believed. SCE is currently assessing the applicability of updated ground motion modeling for the SONGS site.

Recommendations

- SCE should develop an active seismic hazards research program for SONGS similar to PG&E's LTSP to assess whether there are sufficient design margins at the nuclear plant to avoid major power disruptions. The research program should prioritize and include further investigations into the seismic setting at SONGS and should assess whether recent or current seismic, geologic, or ground motion research in the vicinity of SONGS has implications for the long-term seismic vulnerability of the plant. As part of the Energy Commission's future IEPR assessments, beginning with the 2009 IEPR, SCE should report to the Energy Commission on the results of its seismic research efforts.
- The Energy Commission recommends that SCE should use three-dimensional seismic reflection mapping, other techniques, and a permanent GPS array for resolving seismic uncertainties for SONGS. SCE should report on their progress and their most recent seismic vulnerability assessment for SONGS in the 2009 IEPR. Given the potential for an extended plant shutdown following a major seismic event, the Energy Commission, in consultation with appropriate state agencies, should evaluate whether these studies should be required as part of the SONGS license renewal feasibility assessments for the CPUC.
- The California Energy Commission, in cooperation with other appropriate state agencies, should consider the relevance of the USGS National Seismic Hazard Mapping Project models and the UCERF-2 database in the context of studies required as part of the license renewal assessments for SONGS for the CPUC. Updated seismic hazard analyses incorporating these inputs would provide additional information for regulators and the public regarding the seismic hazard at the plant site.

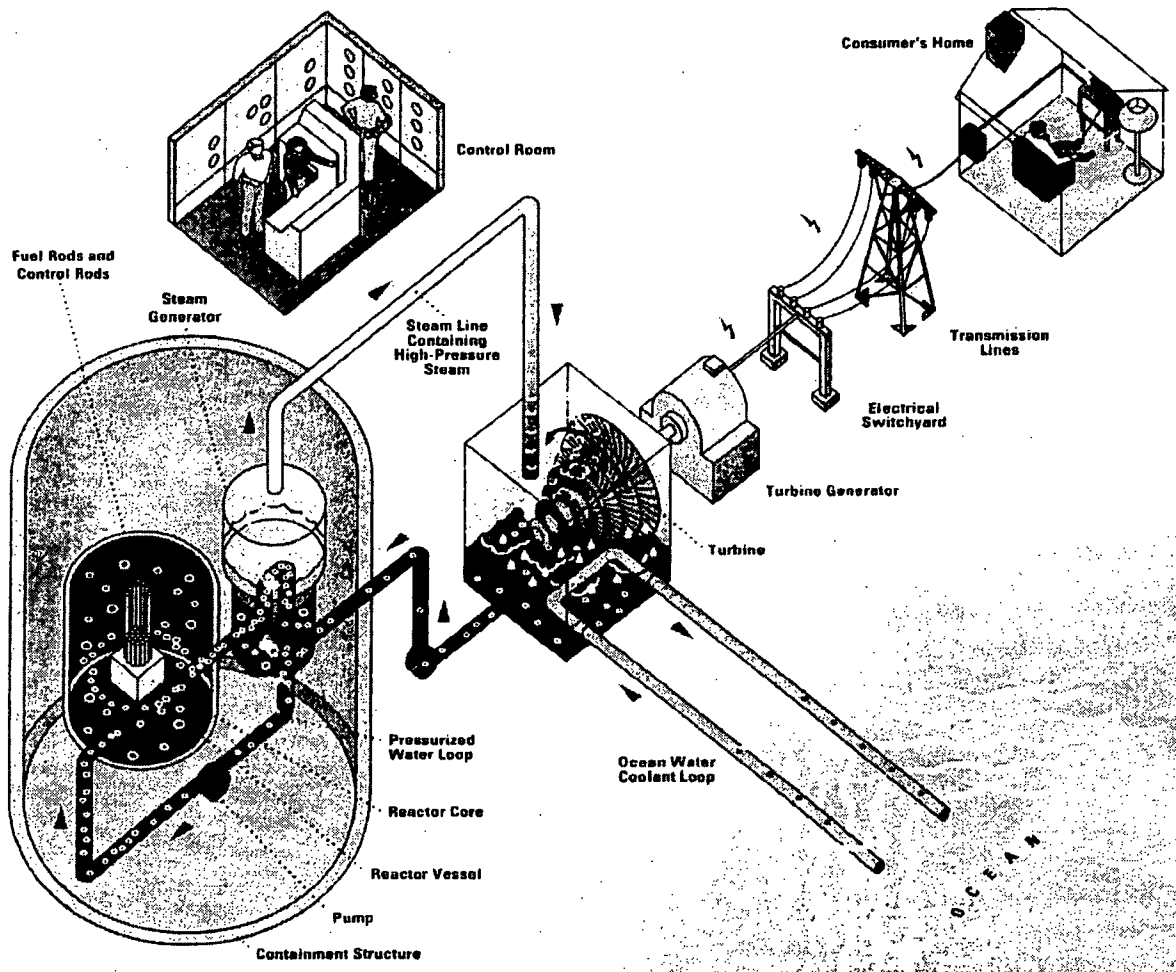
Tsunami Hazards at Diablo Canyon and SONGS

In addition to the direct hazard from earthquake ground motion, there are secondary seismic hazards that could impact the nuclear plants. Liquefaction and landslides do not appear to be significant hazards at Diablo Canyon or SONGS, although a landslide could impair evacuation routes for plant workers and nearby communities, as well as access for emergency equipment and personnel.⁸ There is less certainty regarding the tsunami hazards at the sites because currently available tsunami studies for both plants are at least 10 years old and do not take advantage of modern tools that could improve the quality of the assessments, such as probabilistic hazard assessments, inundation modeling, and new data from the National Oceanic and Atmospheric Administration. Second-generation tsunami run-up maps being

⁸ Multiple access routes are available for both plants.

Earthquakes with magnitudes equivalent to the safe-shutdown earthquakes would likely cause serious damage to Diablo Canyon or SONGS. However, the safety-related portions of the plants—the reactor, primary steam supply, containment, and associated equipment—are expected to withstand safe-shutdown earthquakes without damage that would impact safety (Figure 4).

Figure 4: Nuclear Plant Layout¹⁰



The non-safety related systems, structures, and components (SSCs) of the plants are most vulnerable to damage from earthquakes. Damage to non-safety related SSCs is the greatest

¹⁰ Southern California Edison. <http://www.sce.com/NR/rdonlyres/A050B788-F86C-448A-9A66-8FABD9F302B4/0/NuclearEnergy_process.jpg>.

plant operators. The KK NPP is the largest nuclear plant in the world with the capacity to generate 8,200 megawatts of power when operating. The KK NPP experienced ground motions significantly higher than the design basis ground motion and yet suffered no significant damage to safety-related components. Nevertheless, more than a year after the earthquake, the KK NPP remains shut down. Extensive investigations and a re-evaluation of the seismic design standards for the plant appear to be the primary cause of the lengthy shut-down, suggesting that repairing or replacing damaged components may be just one factor in how long a nuclear power plant is shut down following a major seismic event. Research and investigations into the earthquake and the root causes of damage at the nuclear power plant are ongoing; the Energy Commission and California's nuclear plant owners should stay informed as new information becomes available.

Recommendations

The Energy Commission recommends that PG&E and SCE do the following and report on their progress as part of future IEPR assessments, beginning with the 2009 IEPR:

- Investigate and report their findings on the extent to which their respective plants' non-safety-related systems, structures, and components (SSCs) comply with current building codes and seismic design standards for non-nuclear power plants.
- Evaluate the seismic vulnerability and reliability implications for the nuclear plants' non-safety related SSCs from changes to seismic design standards that have occurred since the plants were designed and built. Such an analysis should consider the IAEA (International Atomic Energy Agency) Standards and Safety Reports and any retrofits that the plant owners may have undertaken and should focus on those plant systems or components whose failure could lead to extended outages.
- Describe plant component repair/replacement plans including initial estimates of time needed to repair or replace key plant systems or components that could cause a prolonged plant outage as a result of earthquake damage. This should consider the fragility of components both in their operating positions and when relocated for refueling or plant maintenance.
- As part of their license renewal feasibility analyses for the CPUC, PG&E and SCE should summarize the lessons learned from the Kashiwazaki-Kariwa plant experience in response to the 2007 earthquake and any implications for Diablo Canyon and SONGS, including whether any additional pre-planning or mitigation could minimize plant outage times following a major seismic event.

Vulnerability of Spent Fuel Storage Facilities to Seismic and Terrorist Events

After nuclear fuel has been used (spent), it must be stored safely prior to disposal. There are two types of storage for spent fuel: pool and dry cask storage. SCE uses both pools and dry cask storage facilities to store the spent fuel from SONGS. PG&E is currently using pools to store all

In general, a dry cask storage facility is considered to have a lower degree of overall risk than a spent fuel pool. Over the last 20 years, there have been no radiation releases from a dry cask storage facility that have affected the public, no radioactive contamination, and no known or suspected attempts of sabotage. A major study on the risks of dry cask storage by Robert Alvarez, a Senior Scholar of Nuclear Policy at the Institute for Policy Studies, suggested that the use of dry cask storage at a nuclear power plant has the potential to reduce the overall risk associated with at-reactor storage of spent fuel, including the risk of seismic and terrorist events, since dry cask storage would allow the spent fuel pools to be returned to their original configuration and design loading.

Dry cask storage probabilistic risk analyses performed by the NRC and the Electric Power Research Institute (EPRI) concluded that there is a greater risk of an event leading to public harm during cask loading and transportation, which occur primarily during the first year of operation, than from routine operations. During the cask loading process, spent fuel is exposed and in motion, which increases the possibility for accidents.

The design of Diablo Canyon's dry cask storage facility incorporated a number of seismic safety features. These features were included after analysis of near-source fault ruptures showed the potential for types of ground motion to which the dry cask storage facility is more sensitive than the power plant. The SONGS dry cask storage facility was built to higher than required seismic standards at all frequencies. In reviewing the facility's seismic design, the California Coastal Commission concluded that even an earthquake much larger or closer than the design earthquake would not produce ground shaking that would exceed the design of the facility.

Limited information is available on the vulnerability of dry cask storage to sabotage or terrorist attack, which is consistent with the National Academies' findings in its 2006 study of commercial spent fuel storage safety and security. While terrorist scenarios have been postulated that could release large quantities of radioactive materials into the environment, an assessment of the likelihood of such scenarios occurring has not been publicly released. Such information is needed for state planning for emergency response and consequence mitigation. Returning spent fuel pools to their original spent fuel spacing configuration would reduce the overall risk associated with spent fuel storage at reactors and, therefore, would help maintain plant reliability.

Recommendations

- PG&E and SCE should return their spent fuel pools to open racking arrangements as soon as feasible, while maintaining compliance with NRC cask and pool spent fuel storage requirements, and report to the Energy Commission on their progress in doing so.
- The Energy Commission should continue to work with the Nuclear Regulatory Commission and the California Office of Homeland Security to obtain the necessary security clearances for selected California officials to review studies that assess the vulnerability of California's nuclear plants, spent fuel storage facilities, and spent fuel shipments to terrorist attacks or sabotage and the consequences of such attacks.

Concerned Scientists, more than three dozen nuclear power reactors have experienced year-plus outages including reactors in California.¹³

There is a clear correlation between the age of a nuclear plant and the number of degradation occurrences at that plant. Effective maintenance programs and regulatory oversight are critical to ensure that aging plant equipment and components are identified and either repaired or replaced with appropriate components before the reliability and safety of the plant are jeopardized. Unchecked age-related degradation could have significant long-term implications.

Nuclear plants are baseload units and are planned to operate as much as possible. A standard measurement of nuclear plant performance is the capacity factor, which is calculated by dividing how much energy a plant actually generates by the total possible energy produced during a given period. Any increase in the amount of time a plant is unavailable or is forced to operate at less than full capacity is reflected in a reduced capacity factor.¹⁴ Reductions in capacity factor over time may provide the first indication of an impact of aging-related degradation at a plant. Capacity factors at Diablo Canyon and SONGS have increased significantly since the early years of plant operation, and both plants achieved five-year average capacity factors of approximately 90 percent.¹⁵ Similar to any other large power facility, the plants' performance record is largely a function of the plant owners' efforts and expenditures to maintain and upgrade the plant and in the skills and care of the plant workers. This does not necessarily indicate the absence of plant degradation, but it suggests that, operational improvements and reductions in down time for plant maintenance and refueling have more than compensated for degradation-related operational losses.

Researchers generally agree that age-related degradation is of greater concern for passive rather than active components. In the 1990s, NRC-sponsored research found that piping, steam generators, and passive components of the reactor pressure vessel comprised over half of nearly 500 reported degradation occurrences at nuclear plants in the U.S. Problems with reactor coolant systems and reactor vessels/components have contributed to the greatest losses in energy production at nuclear plants nationwide. Careful monitoring of these components is crucial. In addition, EPRI's groundwater protection guidelines should be followed to prevent inadvertent releases of tritium due to degraded materials or operational failures.

Plant component aging problems have surfaced at some U.S. nuclear plants outside of California. For example, Davis-Besse (Ohio), Vermont Yankee (Vermont), Oyster Creek (New Jersey), and Indian Point (New York) have all received increased scrutiny by the NRC, government agencies, and/or watchdog groups concerned that different types of age-related degradation are eroding the safety of these plants. The implications for Diablo Canyon and

¹³ Lochbaum, David. "Walking a Nuclear Tightrope: Unlearned Lessons of Year-Plus Reactor Outages." Union of Concerned Scientists. September 2006, pages 8-10.

¹⁴ The capacity factor is defined as the total energy production divided by the total possible energy production from the plant in the given period.

¹⁵ California Energy Commission, *Nuclear Power in California: Status Report 2007*, October 2007, <http://www.energy.ca.gov/2007publications/CEC-100-2007-005/CEC-100-2007-005-F.PDF>.

Recommendations

- To support the long-term reliability of Diablo Canyon and SONGS as the plants age, effective safety culture and maintenance programs must be maintained at the plants in conjunction with enhanced oversight mechanisms, including:
 - a. The Energy Commission should work with federal and state regulators, nuclear plant owners, and INPO (Institute for Nuclear Power Operations) to develop a means for usefully incorporating results of INPO reviews and ratings of reactor operations into a meaningful public process while maintaining the value of these reviews as confidential and candid assessments.
 - b. The Energy Commission should continue to closely monitor NRC actions and reviews of Diablo Canyon's and SONGS' performance. In particular, the state should monitor the NRC's responses to safety culture lapses at SONGS and require SCE to provide evidence of achieving and maintaining a strong plant safety culture prior to SCE's submitting a license renewal application. SCE, as part of the IEPR reporting process, beginning with the 2009 IEPR, should report their progress on how they are addressing the SONGS safety culture issue.
- EPRI's groundwater protection guidelines should be followed to prevent inadvertent releases of tritium due to degraded materials or operational failures.
- The California Public Utilities Commission should continue to recognize the importance of PG&E's and SCE's plant worker training and recruiting programs and approve adequate funding for such programs. On a periodic basis, the state should assess the adequacy and success of PG&E and SCE recruiting and training programs for replacing retiring plant workers and ensuring that knowledge and strong safety cultures are instilled in new workers.

IMPACTS OF A MAJOR DISRUPTION

If an earthquake, age-related plant or equipment failure, or other event leads to an outage at one or both of the nuclear plants, the power from the impaired units would need to be replaced with power from other sources. Actions at other plants not directly related to the in-state nuclear plants could also result in a plant shutdown. For example, a major safety-related event at a nuclear power plant elsewhere in the country could lead to a general shutdown of other nuclear plants for an indefinite period of time. The reliability, cost, and environmental implications of an extended outage would depend on what time of the year the outage occurred and what replacement power was available.

When any of California's nuclear reactors are not operating, the power they produce must be replaced with power from other sources. PG&E and SCE generally schedule refueling outages and other planned maintenance shutdowns to avoid periods of peak electricity demand and reduce the cost of replacement power. However, unplanned outages can occur at anytime. The experiences of nuclear plants nationwide indicate that most unplanned outages last just a few

period in 2012. In years beyond 2012, whether the energy lost from a year-long outage could be readily replaced from in-state resources or imported from other parts of the West depends a great deal on whether WECC (Western Electricity Coordinating Council) and the NERC (Northern American Electric Reliability Corporation) identify both energy and capacity risks in their assessments of system adequacy and whether these risks are fully mitigated by appropriate resource additions that have surplus energy generating potential that can substitute during the hypothetical outage.

The consultant's simulations found that in the event of an extended outage at either nuclear plant, replacement power would be supplied mostly by combined cycle natural gas-fired plants. Approximately 55 to 62 percent of the increased generation would come from in-state gas-fired plants, while the remainder would come from out-of-state gas-fired plants along with a small amount of increased coal generation.

The cost of that replacement power would include the operating costs of in-state units and market costs to acquire power from out-of-state.²⁰ For a year-long loss of either nuclear plant, the simulations found that these costs would be \$470 million higher than the cost to generate power from the nuclear plant. The added cost would increase average rates for customers of either PG&E or SCE/SDG&E by approximately half a cent per kilowatt-hour (kWh) while the outage continued. Plant repair costs likely would further increase rates.

An outage would also pose environmental consequences, since the replacement power would be largely natural gas-fired. The simulations found that a year-long outage at either nuclear plant would increase in-state greenhouse gas emissions from power generation by seven to eight percent, or roughly 4.3 to 4.7 million tons of CO₂. Out-of-state replacement generation would add an additional 2.2 to 2.8 million tons of CO₂, for a total greenhouse gas impact of approximately 7 million tons of CO₂.

Ad Hoc Planning Scenario

The WECC collects electricity load (demand) and resource data from electrical system control areas (balancing authorities) and prepares an annual assessment of winter and summer peak conditions. In preparing its analysis, WECC counts resource additions only when they satisfy various criteria intended to screen out power plant proposals that are not considered committed. Because the purpose of the analysis is to reveal the extent to which peak planning needs are not satisfied by existing resources and committed resource additions, it is a very conservative view of what is actually expected to be in place in future years. Presumably by revealing deficits, it motivates independent generators to develop project proposals or move ahead toward contractual commitments with utilities and actually obtain needed permits and begin construction.

²⁰ The modeling assumes that incremental power from in-state resources can be acquired at the cost of service (i.e. are owned by the utilities or under a tolling contract) while incremental power from out of state must be purchased at market rates calculated internally within the MARKETSYS model.

If this policy is adopted, an extended outage at Diablo Canyon or SONGS might be expected to have consequences somewhere in between the assessment of the two previous scenarios. It is possible that summer peak reliability could be assured, but that providing enough energy to replace Diablo Canyon or SONGS would greatly strain the system. There are ways to cover energy deficits, but most are not easily accomplished or inexpensive. For example, the old steam generating units targeted for retirement or repowering by existing Energy Commission policy could generate more energy, albeit at much higher cost and emissions than would normally be considered acceptable. Few other resources have any “upside” energy generating capabilities.

Evaluating Reliability Implications and Other Transmission Issues

In evaluating these alternative scenarios on the implications of unexpected, lengthy plant shutdowns, the Energy Commission must consider which one, if any, is most appropriate, and whether additional factors that were not modeled directly are important. In the current energy agency planning processes, there does not appear to be an overt consideration of lengthy shutdowns for the nuclear units on reliability or other implications for customers. Further, the July 2008 court decision invalidating South Coast Air Quality Management District’s priority Reserve Rule 1309.1, absent some immediate remedy to restore the rule, threatens power plant additions in the Southern California region. This makes all existing units more critical and less easily replaced. The pessimistic WECC perspective, described above under the West-Wide Resource Adequacy Scenario, might be the most realistic, absent improvements to planning and regulatory processes.

Separate from the broad system perspective on resource adequacy are more detailed local assessments and procurement requirements that attempt to safeguard against outages in local load pockets. Such outages may require generation within the load pocket itself. These load pockets exist when the transmission system is inadequate to support all of the loads in an area.

None of the reliability assessments discussed above considered local transmission constraints that may restrict the deliverability of power to such areas. SONGS is within the Los Angeles Basin load pocket, but Diablo Canyon is not in any local load pocket. Simply based on this classification, SONGS is more critical to reliability for most of Southern California than Diablo Canyon is to Northern California. More complete studies will be needed periodically to reassess the need for replacement power at a system and local level given updated supply and demand conditions and local transmission constraints.

Previous studies have shown that while Diablo Canyon represents a significant generation resource and supports power flows through transmission Path 15 and Path 26, the plant is not needed to maintain reliable operation of the transmission system. During a year-long outage at Diablo Canyon, if replacement power is available, then it can be supplied to end-user loads without a disruption of the overall transmission system. Of course, such replacement power may come at additional cost and with a greater environmental impact since most of the replacement power would come from natural gas-fired plants.

and taxes statewide could be comparable to the benefits currently provided by the nuclear plants.²³

Replacing the nuclear plants with renewable generating facilities would involve a transfer of economic benefits from the coastal communities near Diablo Canyon and SONGS to communities in inland southern California and other areas of the state rich in renewable resources. Recent announcements of several planned large-scale solar facilities in San Luis Obispo County suggest that the transfer of benefits away from the County could potentially be mitigated or offset by renewable power development in the area. In addition, the local economy could see gains from alternate uses of the plant site, other commercial or industrial development elsewhere in the county, and/or a potential increase in property values as a result of the plant closure. Without such potential offsets, the loss of Diablo Canyon would have a significant impact on the county's economy. The loss to the San Diego and Orange County economies from a closure of SONGS would be much less significant since these economies are more diversified and less dependent on the nuclear plant.

A key uncertainty in assessing the economic benefits to keeping Diablo Canyon and SONGS operating through a 20-year license extension is the reliability of the plants as they age. If the plants continue to operate reliably and do not require additional large capital improvements, the cost of power from the nuclear plants will likely remain lower than the cost of power from new renewable resources.²⁴ However, significant equipment failures could result in extended outages and expensive repairs. As discussed earlier, effective plant maintenance and a strong safety culture are critical to keeping the plants operating safely and reliably as they age.

Recommendation

- As part of the license renewal feasibility studies for Diablo Canyon and SONGS, the CPUC should require PG&E and SCE to conduct a detailed study of the local economic impacts of shutting down the nuclear plants compared with alternate uses of the site.

NUCLEAR WASTE ACCUMULATION

Diablo Canyon and SONGS produce significant quantities of radioactive waste in the form of spent fuel and other radioactively contaminated materials. These wastes must be carefully handled, stored, transported, and disposed of to protect humans and the environment from exposure to radioactive materials. Spent nuclear fuel, which is extremely radioactive and

²³ A California law (AB 1451) that temporarily exempts certain renewable energy facilities from property tax assessments will reduce the tax revenue generated from these facilities.

²⁴ Diablo Canyon and SONGS are currently among the least-cost generation resources in the state since the significant costs to construct the plants (roughly five billion dollars for each plant) have been depreciated or passed on to shareholders, and the cost of nuclear fuel is much lower than the cost of fuel for fossil-fueled plants. More information on the historic and current costs of Diablo Canyon and SONGS can be found in Chapter 6 of *Nuclear Power in California: 2007 Status Report*, available at <http://www.energy.ca.gov/2007publications/CEC-100-2007-005/CEC-100-2007-005-F.PDF>. Please also see *Comparative Costs of California Central Station Electricity Generation Technologies, Final Staff Report*, California Energy Commission, Dec. 2007, CEC-200-2007-011-SF.

accepting spent fuel from utilities. PG&E and SCE have sued DOE for reimbursement of their dry cask storage costs, claiming that this delay represents a breach of contract. PG&E received a favorable judgment that provides for reimbursement of certain dry cask storage costs while denying other claims. PG&E is currently appealing the decision. A trial date to hear SCE's claim has not been set.

Utility dry cask storage is an interim solution for waste disposal. PG&E's facility is designed for a lifetime of 50 years, and the canisters used in SCE's facility are designed for a lifetime of 40 years. If the spent fuel is not transported off-site within the design lives of the dry cask storage facility components, the spent fuel may need to be repackaged on-site and transferred into new storage canisters, or the current canisters or other cask storage facility components may need to be bolstered. The long-term storage, packaging, and transport of this waste add to the expense and the risk of nuclear power in California. At this time there are no estimates as to how long the spent fuel will remain in interim dry-cask storage, and no additional off-site or on-site interim fuel storage facilities are being considered by either PG&E or SCE.

If a federal repository is established, spent fuel will need to be packaged for transport, aging, and disposal (TAD) at a repository. DOE has proposed designing and developing a new TAD canister packaging system, but has not yet established federal TAD packaging requirements, forcing PG&E and SCE to move forward with dry cask storage cask designs that may not be compatible with the federal TAD requirements. The costs for transport of spent fuel to off-site storage or disposal facilities will be substantial, including costs for security, accident prevention, and emergency preparedness. Policies are being developed to federally fund state and county emergency response preparation for shipments to the proposed repository; however, California has claimed that the proposed federal program may be insufficient, both in the planned timing of the grant program and the amount of the proposed grants for state planning and for training emergency response personnel to respond to potential accidents involving California's spent fuel shipments.

Low-level radioactive waste generated at nuclear power plants also requires care in handling, transport, and disposal. There are only three facilities in the U.S. that accept low-level waste for disposal and, as of June 30, 2008, only the Energy Solutions facility in Clive, Utah, accepts low-level waste from Diablo Canyon and SONGS. It is expected that Class A waste will continue to be shipped to Clive, Utah, but that Class B and C wastes (waste with higher levels of radioactivity) will be stored on-site at Diablo Canyon and SONGS until a new or existing facility agrees to accept this waste. This does not pose a significant problem at present because the volume of this waste is relatively small, and the waste can be safely stored on site. However, the plants cannot be fully decommissioned until the waste is removed from the plant sites. The NRC is currently reviewing its policies regarding on-site low-level waste storage and expects to complete this task by the end of 2008.

Low-level waste disposal costs are relatively modest during ongoing plant operations. However, a substantial quantity of low-level waste will need to be disposed of when the plants are decommissioned, and the cost to transport and dispose of this waste, presuming a disposal facility is available, is expected to be hundreds of millions of dollars or more. A 2004 GAO

Accordingly, the presence of dry cask storage facilities at Diablo Canyon and SONGS after the plants are decommissioned should not prevent alternate uses from being established, if their proximity to major faults is not a consideration.

Residents of San Luis Obispo County expressed a strong preference that the Diablo Canyon plant site be converted to recreational use, but PG&E has not identified any priorities as to future plans for the plant site. The SONGS plant site, which is located on military land, will remain under the control of the U.S. Navy. The Navy will have the option to use the land for military purposes, to lease or sell it to another party, or to open it for recreational use. As long as spent fuel remains stored at the SONGS site, an NRC license will be required.

Even with a plant site converted to alternate uses, the question remains as to whether the continued presence of the spent fuel has a negative impact on property values, business, and tourism in the area. Academic research does not lead to a strong conclusion that a dry cask storage facility would negatively affect nearby property values. However, the available analytical studies are extremely limited and only partially relevant, and the available surveys appear to be unreliable predictors of economic effects. An analysis of property sales data and other economic indicators in areas where a dry cask storage facility is operating would provide a useful starting point to assess potential economic impacts of extended spent fuel storage at California's nuclear plants.

POWER GENERATION OPTIONS

The California legislature, through Assembly Bill 32 (AB 32, Nunez, Chapter 488, Statutes of 2006), has mandated greenhouse gas reductions statewide. The California Air Resources Board, the California Public Utilities Commission, and the Energy Commission are integrating this mandate into the state's energy policies. As the Energy Commission stated in the 2007 *Integrated Energy Policy Report*, "AB 32 forces California to determine how to meet its electricity needs in a way that leaves an ever-shrinking *greenhouse gas* footprint."²⁷

As mentioned, state policy sets the following "loading order" for meeting California's growing energy demand while lowering greenhouse gas emissions: energy efficiency, renewable resources, and distributed generation.²⁸ Substantial economic, environmental, and regulatory barriers to developing new nuclear power plants in California mean that new nuclear plants cannot be relied on, at least in the near term, to meet California's AB 32 greenhouse gas emissions reduction goals for 2020.²⁹

²⁷ California Energy Commission. 2007 *Integrated Energy Policy Report*. CEC-100-2007-008-CMF, page 35.

²⁸ California law (Public Resources Code 25524) prohibits the permitting of land-use for a new commercial nuclear power plant until a federally approved means for the permanent disposal or commercial reprocessing of spent fuel is available. This effectively excludes nuclear power as a means to meet California's growing energy demand.

²⁹ New nuclear power plant construction in California was suspended in 1976 pending a determination by the Energy Commission that a high-level federal nuclear waste disposal repository has been approved and built. In the 2005 IEPR, the Energy Commission reaffirmed its finding made in 1978 that a "high-level waste disposal technology has been neither demonstrated nor approved." The 2007 IEPR further discusses the status of the federal waste disposal

would be conferred to different localities. The communities currently benefiting from the nuclear plants would lose jobs and revenue unless the nuclear plants were replaced by other income-generating facilities. Notably, several large-scale solar projects are currently being planned in San Luis Obispo County.

Preliminary modeling suggests that replacing the state's two nuclear plants with renewable generation and using existing fossil-fuel units for reliability support could incur significant costs. Additional modeling is needed to fully understand the economic and environmental tradeoffs, as well as the implications on the California power grid, of long-term outages or permanently retiring Diablo Canyon and SONGS.

Recommendation

- As part of license renewal feasibility studies for Diablo Canyon and SONGS, the CPUC should require detailed studies of alternative power generation options to quantify the reliability, economic, and environmental impacts of replacement power options.

LICENSE RENEWAL ISSUES FOR STATE POLICYMAKERS

Diablo Canyon and SONGS have been operating for approximately half of their 40-year initial license periods, and PG&E and SCE are exploring the feasibility of seeking 20-year license renewals for the plants.³⁰ If granted, license renewals could keep Diablo Canyon and SONGS in operation until the early to mid 2040s (Table 1).

Table 1: Licensing Dates at California's Nuclear Reactors

Plant	Unit	Size	Date Commercial Operation Began	Expiration of Current License	Potential License Expiration with Renewal
Diablo Canyon ³¹	Unit 1	1,122 MW	May 7, 1985	Nov. 2, 2024	Nov. 2, 2044
	Unit 2	1,118 MW	Mar. 15, 1986	Aug. 26, 2025	Aug. 26, 2045
SONGS	Unit 2	1,070 MW	Aug. 8, 1983	Feb. 16, 2022	Feb. 16, 2042
	Unit 3	1,080 MW	Apr. 1, 1984	Nov. 15, 2022	Nov. 15, 2042

³⁰ Current NRC regulations allow reactors licenses to be extended for 20-year periods. The NRC is investigating the feasibility of a second 20-year license renewal option. U.S. Nuclear Regulatory Commission; See 10 CFR 54.31d and Federal Register Volume 56, No. 240, December 13, 1991, pp. 64965-64964.. "Future Challenges for the Nuclear Science and Engineering Community." Remarks of NRC Chairman Dale Klein at the International Conference on Nuclear Engineering, Orlando. May 12, 2008.

³¹ The capacity of Diablo Canyon, as reported on PG&E FERC Forms 1, increased from 2,150 MW in 2005 to 2,240 MW in 2006.

The CPUC specified that the application should address: (1) whether license renewal is cost effective and in the best interests of PG&E's ratepayers, (2) the AB 1632 assessment, and (3) any legislative framework that may be established for reviewing the costs and benefits of license renewal. The CPUC said that PG&E's 2011 General Rate case will result in a decision on whether PG&E should pursue a license renewal and that the results of the proceeding will be incorporated into the Energy Commission's 2013 IEPR and the CPUC's 2014 long-term procurement plan (LTPP). This timeframe is intended to provide the state and PG&E with sufficient time (approximately 12 years) to develop alternate resources should the decision be made to forego Diablo Canyon license renewal.³⁶ PG&E said at the Energy Commission's October 20, 2008 AB 1632 workshop and in written comments that PG&E does not interpret CPUC directives as requiring PG&E to include in their study issues that are outside the scope of NRC's license renewal proceeding.³⁷ In addition, PG&E stated that many of the items that this Report recommends including in the license renewal feasibility study are already being addressed in ongoing programs under the existing plant operating license and are subject to NRC review. However, the CPUC's GRC 2007 decision clearly directs PG&E not only to defer to the extent feasible its own license renewal study until after the Energy Commission issues its AB 1632 findings and conclusions, it requires PG&E to incorporate the Energy Commission's AB 1632 Report's assessment, findings and recommendations into their license renewal feasibility study.

SCE requested approval of \$17 million for a similar feasibility study for SONGS. A decision on this funding is expected in the coming months as part of SCE's 2009 General Rate Case. It can be expected that the CPUC will require SCE to seek CPUC approval before proceeding with an NRC license renewal application and incorporate the AB 1632 assessment, findings and recommendations, as required for PG&E.

If the CPUC determines that license renewal is not cost-effective for either Diablo Canyon or SONGS, the CPUC could use its rate authority to effectively restrict the operation of the plant through an extended license period, even if a license renewal is granted. Such an action would not conflict with the NRC's regulatory authority over the radiological aspects of nuclear power.

The decision whether or not to renew Diablo Canyon's and SONGS' operating licenses will have a significant impact on the state's power supply portfolio and on the communities located near the reactors. The full implications of this decision are unknown. Even the most straightforward question of how much power would be impacted by this decision cannot be answered with certainty. While current production levels from the plants are known, it is unclear how performance will change as the plants age—no commercial reactor has yet operated for a full 60 years.

³⁶ California currently plans for long-term power procurement through the CPUC biennial adoption of a rolling 10-year long-term procurement plan (LTPP). The purpose of the LTPP is to identify resource needs a decade in advance to provide sufficient time to plan for, and procure, new capacity in an orderly and cost effective manner.

³⁷ Letter dated October 22, 2008, to Barbara Byron, Energy Commission, from Mark Krause at http://www.energy.ca.gov/ab1632/documents/2008-10-20_workshop/comments/

plants have prolonged outages; implications for grid reliability if these plants shut down; and the overall economic and environmental costs and benefits of license extension. The utilities should report on the status and results of their license renewal feasibility studies as part of the IEPR process, beginning with the 2009 IEPR.

ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
California ISO	California Independent System Operator
CO ₂	Carbon Dioxide
Coastal Commission	California Coastal Commission
CPUC	California Public Utilities Commission
Diablo Canyon	Diablo Canyon Power Plant
DCISC	Diablo Canyon Independent Safety Committee
DOE	U.S. Department of Energy
EIS	Environmental Impact Statement
Energy Commission	California Energy Commission
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
FY	Fiscal Year
GHG	Greenhouse Gas
GNEP	Global Nuclear Energy Partnership
GPS	Global Positioning System
IAEA	International Atomic Energy Agency
IEPR	Integrated Energy Policy Report
INPO	Institute for Nuclear Power Operation
KK NPP	Kashiwazaki-Kariwa Nuclear Power Plant
km	Kilometer
kV	Kilovolt
kW	Kilowatt
kWh	Kilowatt-hour
LCA	Life Cycle Analysis
LTPP	Long-term Power Procurement Plan
LTSP	Long-Term Seismic Program
LSE	Load Serving Entity
MSPI	Mitigating Systems Performance Index

USC	U.S. Code
USGS	U.S. Geological Survey
VAR	Volt-Amperes Reactive
WECC	Western Electricity Coordinating Council
WIEB	Western Interstate Energy Board

GLOSSARY OF TECHNICAL TERMS

Active components – The components of nuclear power plants that continuously operate or change states to perform their functions. These include pumps, turbines, generators, compressors, process sensors, electric breakers, relays, and switches.

Age-related degradation – The cumulative degradation occurring within a reactor system, structure, or component, which, if unmitigated, may result in loss of function or impaired safety.

Blind thrust faults – A thrust fault that does not rupture all the way up to the surface so there is no evidence of it on the ground. It is "buried" under the uppermost layers of rock in the crust.

Capacity factor – The ratio of the electrical energy produced by a generating unit for the period of time considered to the electrical energy that could have been produced at continuous full power operation during the same period.

High-level waste – Highly radioactive nuclear waste from the reprocessing of spent fuel. Spent nuclear fuel, which is also highly radioactive, is sometimes called high-level waste.

Integrated Energy Policy Report - Senate Bill 1389 (Bowen and Sher, Chapter 568, Statutes of 2002) requires the Energy Commission, every two years with updates in alternate years, to "conduct assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand and prices." The Energy Commission uses these assessments and forecasts to develop energy policies that conserve resources, protect the environment, ensure energy reliability, enhance the state's economy and protect public health and safety.

Liquefaction – A process by which water-saturated sediment temporarily loses strength and acts as a fluid; can be caused by earthquake shaking.

Low-level waste – Radioactive waste that is not classified as high-level radioactive waste, spent nuclear fuel, transuranic waste, or by-product material. Low-level waste is categorized as Class A, B, or C and Greater-Than-Class-C waste. The latter classes are the most radioactive and require the most rigorous disposal specifications.

Once-through cooling system – The process of piping water from the ocean to power plants for cooling and then discharging warmer water back into the ocean.

Operating basis earthquake (OBE) – An earthquake that could reasonably be expected to affect the plant site during the operating life of the plant; often designated at half the magnitude of a safe-shutdown earthquake.

Passive components – Nuclear plant components that generally remain in one state over time to perform their functions, such as pipes, tanks, pressure vessels, certain heat exchangers, electrical conduit and wiring, insulation, structures, and structural supports.

From: Harrington, Holly
Sent: Thursday, April 07, 2011 11:13 AM
To: LIA06 Hoc; LIA08 Hoc; Anderson, Brian; Clark, Theresa; Stuckle, Elizabeth; Chandrathil, Prema; Dricks, Victor; Hannah, Roger; Ledford, Joey; Mitlyng, Viktoria; Screnci, Diane; Sheehan, Neil; Uselding, Lara; Brenner, Eliot; Burnell, Scott; Couret, Ivonne; Hayden, Elizabeth; McIntyre, David
Cc: LIA11 Hoc; LIA12 Hoc; LIA03 Hoc; Powell, Amy
Subject: Blog Post Now Up: First Person Account from the NRC Team in Japan

This may be of interest to folks:

<http://public-blog.nrc-gateway.gov/>

KKKK-147

From: Hoc, PMT12
Sent: Wednesday, April 06, 2011 1:08 PM
To: PMT09 Hoc
Subject: FW: TEPCO Earthquake Information Update on March 20: Fukushima-Daiichi Radiation Monitoring Data
Attachments: image002.gif; image003.gif; 201100321 0400am Radiation Data.xls

From: LIA02 Hoc
Sent: Sunday, March 20, 2011 7:32 PM
To: PMT01 Hoc; Hoc, PMT12
Cc: LIA03 Hoc
Subject: FW: TEPCO Earthquake Information Update on March 20: Fukushima-Daiichi Radiation Monitoring Data

This just in...

From: Hidehiko Yamachika [mailto:yamachika-hidehiko@jnes-usa.org]
Sent: Sunday, March 20, 2011 7:30 PM
To: LIA02 Hoc; LIA02 Hoc
Cc: aono-kenji@jnes-usa.org; Michael W. Chinworth
Subject: FW: TEPCO Earthquake Information Update on March 20: Fukushima-Daiichi Radiation Monitoring Data

FYI

This is from TEPCO Washington.

From: 松尾 建次 [mailto:matsuo.kenji@wash.tepco.com] **On Behalf Of** matsuo.kenji@tepco.co.jp
Sent: Sunday, March 20, 2011 7:18 PM
To: matsuo.kenji@tepco.co.jp
Subject: TEPCO Earthquake Information Update on March 20: Fukushima-Daiichi Radiation Monitoring Data

TEPCO Earthquake Information Update on March 20: Fukushima-Daiichi Radiation Monitoring Data

Dear Friends,

Attached a file compiled radiation monitoring data from March 11 to March 21 at 4:00 am.

The original data is updated on the following TEPCO web site (but in Japanese):

R/K K/K-148

Fukushima-Daiichi NPS

http://www.tepco.co.jp/nu/f1-np/press_f1/2010/2010-j.html

Fukushima-Daini NPS

http://www.tepco.co.jp/nu/f2-np/press_f2/2010/2010-j.html

Contacts:

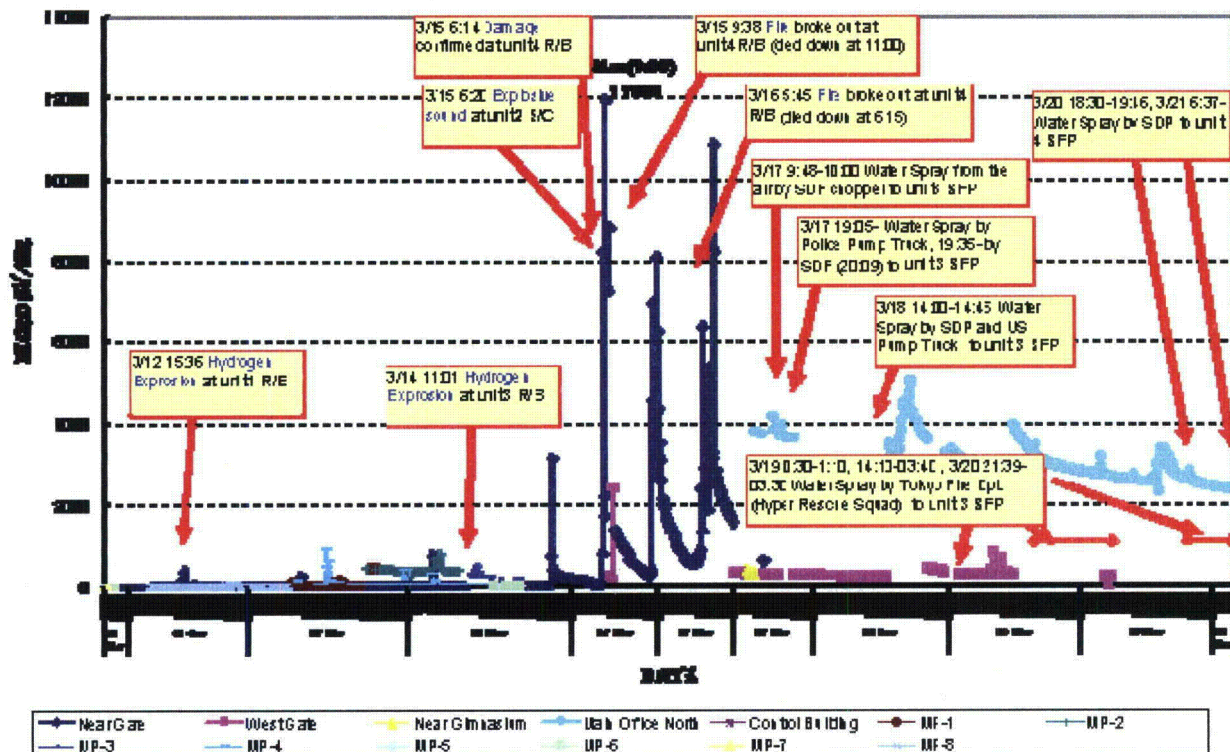
TEPCO Washington Office 202-457-0790

Kenji Matsuo, Director and General Manager

Yuichi Nagano, Deputy General Manager,

Masayuki Yamamoto, Manager, Nuclear Power Programs

RADIATION MONITORING AT FUKUSHIMA-DAIICHI NPS



Fukushima-Daiichi

		Gamma Radiation :maicro SV/hr			
Date	Time	Near Gate	West Gate	Near Gimnasi Main Office	Nc Control Buildir MP-1
11-Mar	17:30			0.049	
	17:40	0.056			
	17:50				0.064
	18:45				
	19:00				
	19:10				
	19:15				
	19:20				
	19:52				
	20:00				
	20:10				
	20:20				
	21:30	0.062			
	21:40	0.061			
	21:50	0.061			
	22:00	0.059			
	22:10	0.060			
	22:20	0.062			
	22:30	0.060			
	22:40	0.060			
	22:50	0.059			
	23:00	0.060			
	23:10	0.063			
	23:20	0.060			
	23:40	0.063			
	23:50	0.059			
12-Mar	0:00	0.060			
	0:10	0.062			
	0:20	0.065			
	0:30	0.064			
	0:40	0.063			
	1:40	0.068			
	1:50	0.066			
	2:00	0.068			
	2:10	0.064			
	2:20	0.067			
	2:30	0.065			
	2:40	0.066			
	2:50	0.065			
	3:00	0.069			
	3:10	0.066			
	3:20	0.069			
	3:30	0.068			
	3:40	0.066			
	3:50	0.064			
	4:00	0.069			
	4:40	0.866			
	4:50	1.002			

5:00	1.307
5:10	1.590
6:25	
6:30	3.290
6:40	4.920
7:35	
7:40	
7:45	
7:50	4.970
7:55	
8:00	4.890
8:05	
8:10	5.080
8:15	
8:20	4.770
8:25	
8:30	
8:35	
8:40	4.560
8:45	
8:50	4.870
9:10	
9:15	
9:20	
9:25	
9:30	5.160
9:35	
9:40	
9:45	
9:50	5.030
9:55	
10:00	5.280
10:05	
10:10	6.650
10:15	
10:20	180.200
10:25	
10:30	385.500
10:35	
10:40	162.900
10:45	
10:50	7.040
11:00	6.690
11:10	6.320
11:20	9.430
11:30	35.770
11:40	12.530
11:50	17.100
12:00	23.210
12:05	
12:10	48.230
12:15	

12:20	11.560
12:25	
12:30	5.780
12:40	5.620
12:50	5.480
13:00	5.390
13:10	5.310
13:20	10.900
13:30	
13:40	4.782
13:50	4.820
13:55	3.130
14:00	4.600
14:10	7.300
14:20	10.900
14:30	9.983
14:40	8.860
14:50	7.720
15:00	6.950
15:10	6.990
15:20	5.590
15:30	5.490
15:40	8.230
15:50	5.311
16:00	5.290
16:10	3.640
16:20	3.430
16:30	3.320
16:40	3.250
16:50	3.250
19:25	
19:50	23.900
20:00	2.740
20:10	3.210
20:20	3.190
20:30	3.160
20:40	
20:50	
21:00	
21:10	
21:20	
21:30	
21:40	
21:50	2.958
22:00	2.985
22:10	21.620
22:20	2.910
22:30	2.920
22:35	
22:40	2.850
22:50	3.140
23:00	3.330

	23:10	3.290
	23:20	3.270
	23:30	3.090
	23:40	3.210
	23:50	3.070
13-Mar	0:00	3.160
	0:10	3.291
	0:20	3.016
	0:30	3.146
	0:40	3.181
	0:50	3.177
	1:00	3.201
	1:10	3.207
	1:20	3.163
	1:30	3.127
	1:40	3.329
	1:50	3.125
	2:00	3.186
	2:10	3.116
	2:20	3.214
	2:30	3.164
	2:40	3.129
	2:50	3.104
	3:00	3.574
	3:10	3.978
	3:20	3.236
	3:30	3.103
	3:40	3.392
	3:50	3.186
	4:00	3.039
	4:10	3.564
	4:20	3.150
	4:30	3.122
	4:40	3.256
	4:50	3.104
	5:00	3.204
	5:10	3.360
	5:20	3.472
	5:30	3.817
	5:40	3.224
	5:50	3.192
	6:00	3.467
	6:10	3.188
	6:20	3.160
	6:30	3.625
	6:40	3.092
	6:50	3.006
	7:00	3.652
	7:10	3.415
	7:20	3.325
	7:30	3.530
	7:40	3.413

7:50	7.227	
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8:10	3.166	100.000
8:20		100.000
8:30	14.730	80.000
8:40	16.030	80.000
8:50	15.900	90.000
9:00	10.240	37.000
9:10	175.000	30.000
9:20	281.700	27.000
9:30	26.000	25.000
9:40		25.000
9:50		23.000
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10:10	6.372	23.000
10:20	8.265	20.000
10:30	6.755	19.000
10:40	6.020	19.000
10:50	6.038	19.000
11:00	5.766	18.000
11:10	5.610	18.000
11:20	5.998	18.000
11:30	7.888	17.000
11:40	6.837	17.000
11:50	6.617	17.000
12:00	5.545	17.000
12:10	5.537	18.000
12:20	5.316	18.000
12:30	5.495	17.000
12:40	5.266	17.000
12:50	5.369	17.000
13:00	4.953	17.000
13:10	4.794	17.000
13:20	4.907	17.000
13:30	4.852	16.000
13:40	4.833	16.000
13:50	4.965	24.000
14:00	21.880	21.000
14:10	39.710	21.000
14:20	57.630	21.000
14:30	17.610	32.000
14:40	10.050	52.000
14:50	10.850	35.000
15:00	8.311	52.000
15:10	5.717	100.000
15:20	4.717	24.000
15:30	4.461	34.000
15:40	4.360	24.000
15:50	5.469	30.000
16:00	5.154	31.000
16:10	4.555	45.000
16:20	4.336	150.000

16:30	4.277	46.000
16:40	4.235	60.000
16:50	4.224	30.000
17:00	4.301	120.000
17:10	4.213	62.000
17:20	4.640	45.000
17:30	5.171	36.000
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18:50	4.831	25.000
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19:10	5.007	23.000
19:20	4.709	22.000
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19:30	4.622	20.000
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19:40	4.844	26.000
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19:50	5.557	24.000
19:51		
20:00	5.721	24.000
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20:41		
20:50	4.377	
20:51		440.000
21:00	4.371	
21:01		
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21:11		
21:20	4.463	
21:21		
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21:31		
21:40	4.785	
21:41		
21:50	4.626	
21:51		
22:00	4.636	
22:01		
22:10	4.622	

22:11	
22:20	5.417
22:21	
22:30	4.645
22:31	
22:40	4.622
22:41	
22:50	4.632
22:51	
23:00	4.668
23:01	
23:10	4.700
23:11	
23:20	4.647
23:21	
23:30	4.610
23:31	
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23:41	
23:50	4.868
23:51	

14-Mar

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0:11	
0:20	4.582
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0:40	4.450
0:41	
0:50	4.442
0:51	
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1:01	
1:10	4.426
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1:50	4.371
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2:10	4.594
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2:30	433.000
2:40	420.000
2:50	66.270
3:00	65.520

3:10	45.500
3:20	15.430
3:30	18.990
3:40	14.990
3:50	10.320
4:00	10.070
4:10	6.706
4:20	7.748
4:30	7.710
4:40	7.045
4:50	6.900
4:51	
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5:01	
5:10	6.516
5:11	
5:20	6.735
5:21	
5:29	
5:30	6.494
5:40	6.410
5:41	
5:50	6.340
5:41	
6:00	5.144
6:01	
6:10	5.021
6:11	
6:20	5.032
6:21	
6:30	4.920
7:53	
8:07	
8:19	
8:30	
8:31	
8:40	
8:41	
8:50	
9:00	
9:10	
9:12	
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9:25	
9:30	
9:40	
9:43	
9:50	
9:53	
10:00	
10:05	
10:10	

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10:27	
10:30	
10:35	
10:40	
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10:50	
10:51	
11:37	50.387
11:44	19.600
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12:34	
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12:52	
13:04	
13:10	12.000
13:12	
13:15	13.000
13:20	15.000
13:25	14.000
13:28	
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13:45	12.000
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13:55	15.000
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14:14	
14:30	
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14:58	
15:09	
15:16	
15:23	
15:30	
15:38	
16:02	
16:10	
17:00	8.100
17:10	8.100
17:20	7.275
17:30	7.605
17:40	7.620
17:50	8.044
18:00	7.637
18:10	7.037
18:20	7.177
18:30	8.047
18:40	10.400

18:46	10.100
19:00	7.700
19:10	7.800
19:20	7.700
19:30	8.900
19:40	7.600
19:50	5.500
20:00	5.400
20:10	5.400
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20:50	5.800
20:55	5.000
21:00	5.800
21:05	5.800
21:10	6.000
21:15	5.800
21:20	6.000
21:25	6.800
21:30	29.700
21:35	760.000
21:37	3130.000
22:15	431.700
22:20	336.600
22:25	301.900
22:35	326.200
22:40	293.700
22:45	271.700
22:50	267.000
22:55	263.000
23:00	252.700
23:05	242.800
23:10	235.300
23:15	231.500
23:20	227.000
23:25	216.000
23:30	216.000
23:35	211.300
23:40	205.600
23:45	201.700
23:50	196.200
23:55	192.300

15-Mar

0:00	188.900
0:05	185.000
0:10	181.000
0:15	177.300
0:20	175.800
0:25	173.300
0:30	168.000
0:35	164.900
0:40	164.400

0:45	167.600	
0:50	164.300	
0:55	151.700	
1:00	150.300	
1:05	147.100	
1:20	137.800	
1:30	135.500	
1:40	130.400	
1:50	123.300	
2:00		
2:10	114.100	
2:20	111.400	
2:30	109.600	
2:40	105.400	
3:10	94.300	
3:20	92.800	
3:40	87.000	
4:00	81.900	
4:20	77.600	
4:40	73.600	
5:00	70.000	
5:20	67.400	
5:40	65.700	
6:00	73.200	
8:20	807.700	
8:31	8217.000	
8:40	1726.000	
8:50	2208.000	
9:00	11930.000	
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9:20		
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10:15	8837.000	
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11:45		162.400
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12:15		2434.000
12:25	1407.000	
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12:45	1267.000	
12:55	1216.000	
13:00	1191.000	
13:10	1148.000	
13:20	1100.000	
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13:40	1014.000	
13:50	969.900	
14:00	928.200	
14:10	903.900	
14:20	874.400	
14:30	855.500	
14:40	821.300	

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15:20	613.800
15:30	596.400
15:40	566.900
15:50	544.900
16:00	531.600
16:10	513.200
16:20	502.600
16:30	489.800
16:40	473.000
16:50	460.300
17:00	449.400
17:10	437.500
17:30	423.500
18:00	401.700
18:30	403.000
19:00	353.800
19:30	343.300
20:00	347.000
20:30	311.300
21:00	298.800
21:30	282.600
22:00	313.200
22:30	431.800
23:00	4548.000
23:10	6960.000
23:15	2761.000
23:20	3648.000
23:25	4976.000
23:30	8080.000
23:35	6308.000

16-Mar

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0:20	3108.000
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2:20	1453.000
2:30	1386.000
2:40	1357.000
2:50	1316.000
3:00	1267.000
3:30	1159.000
4:00	1047.000

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5:00	918.200
5:30	868.000
6:00	884.000
6:30	848.400
6:40	837.000
6:50	815.900
7:00	808.800
7:10	670.300
7:20	661.800
7:30	651.100
7:40	644.000
7:50	636.800
8:00	627.500
8:10	620.600
8:20	613.900
8:30	606.600
8:40	600.400
8:50	593.400
9:00	587.600
9:10	582.700
9:20	582.400
9:30	582.300
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9:50	700.600
10:00	810.300
10:10	908.500
10:20	2399.000
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13:20	2430.000
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13:50	2182.000
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14:30	1937.000
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14:50	1835.000
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15:20	1697.000
15:30	1664.000
15:40	1629.000
15:50	1591.000

17-Mar

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3:00	344.600	
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8:00		379.000
8:30		373.000
8:40		372.500
8:50		372.700
9:00		373.700
9:10		371.900
9:30		3786.000
9:40		3782.000
9:50		3763.000
10:00		3759.000
10:10		3755.000
10:20		3754.000
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11:20		312.500
11:30		312.300
12:00		311.000
12:30		310.700
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13:10		309.300
13:20		309.100

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13:40		4165.000
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14:30	310.300	
15:00	309.100	
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23:30	288.700	
23:40	287.800	
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	0:30	286.400
	0:40	286.300
	0:50	286.000
	1:00	285.600
	1:10	285.500

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1:40	284.600
1:50	284.400
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2:20	283.700
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2:40	283.000
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3:50	281.200
4:00	281.100
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4:50	279.800
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6:40	272.700
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7:50	271.200
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8:10	270.300
8:20	269.900
8:30	269.900
8:40	269.800
8:50	269.200
9:00	268.700
9:10	267.600
9:20	268.900
9:30	267.500
9:40	267.000
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4:00	301.700
4:10	301.300
4:20	300.500
4:30	299.200
4:40	299.200
4:50	298.500
5:00	297.500
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6:00	293.800
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6:20	292.600
6:30	292.300
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6:50	290.900
7:00	290.600
7:10	289.800
7:20	289.100
7:30	288.900
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9:00	364.500
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10:20	338.400
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18:40		2992.000
18:50		2978.000
19:00		2972.000
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19:30		2957.000
19:40		2946.000
19:50		2941.000

	20:00	2937.000
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	20:30	2917.000
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	22:00	2880.000
	22:10	2876.000
	22:20	2855.000
	22:30	2854.000
	22:40	2847.000
	22:50	2844.000
	23:00	2841.000
	23:10	2836.000
	23:20	2828.000
	23:30	2828.000
20-Mar	0:00	2821.000
	0:10	2814.000
	0:20	2808.000
	0:30	2805.000
	0:40	2803.000
	0:50	2791.000
	1:00	2797.000
	1:10	2794.000
	1:20	2793.000
	1:30	2788.000
	1:40	2785.000
	1:50	2781.000
	2:00	2778.000
	2:10	2773.000
	2:20	2771.000
	2:30	2767.000
	2:40	2764.000
	2:50	2761.000
	3:00	2759.000
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	3:20	2745.000
	3:30	2741.000
	3:40	2758.000
	3:50	3185.000
	4:00	2939.000
	4:10	2771.000
	4:20	2743.000
	4:30	2739.000
	4:40	273.200
	4:50	271.800

5:00	271.200	
5:10	27.900	
5:20	270.400	
5:30	269.800	
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6:00		2679.000
6:10		2679.000
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7:10		2661.000
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10:20		2605.000
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11:00		2579.000
11:10		2578.000
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11:50		2564.000
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12:10		2558.000
12:20		2552.000
12:30		2551.000
12:40		2551.000
12:50		2550.000
13:00		2567.000
13:10		2588.000
13:20		2660.000
13:30		2593.000

13:40	2654.000
13:50	2741.000
14:00	2768.000
14:10	2999.000
14:20	2323.000
14:30	3056.000
14:40	3202.000
14:50	3346.000
15:00	3054.000
15:10	3071.000
15:20	3342.000
15:30	3337.000
15:40	3003.000
15:50	3046.000
16:00	3171.000
16:10	2940.000
16:20	2851.000
16:30	2830.000
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16:50	2839.000
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17:10	2763.000
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18:50	2658.000
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21:40	2517.000
21:50	2510.000
22:00	2506.000
22:10	2503.000

	22:20	2492.000
	22:30	2487.000
	22:40	2485.000
	22:50	2483.000
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	0:30	2439.000
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	2:30	2385.000
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	2:50	2380.000
	3:00	2378.000
	3:10	2375.000
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	3:50	2364.000
	4:00	2362.000

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2.420	less than 0.001
2.430	
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2.360	
2.400	
2.340	less than 0.001
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2.680	
2.770	
2.550	
2.590	
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2.620	
2.640	
2.610	less than 0.001
2.620	
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4.560	
4.610	less than 0.001
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3.800	less than 0.001
4.050	less than 0.001
5.320	less than 0.001
8.800	
	less than 0.001
11.700	

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3.600	less than 0.001
3.520	less than 0.001
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2.810	less than 0.001
2.110	less than 0.001
3.020	less than 0.001
3.800	less than 0.001
3.490	less than 0.001
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3.210	less than 0.001
3.330	less than 0.001
2.190	less than 0.001
2.220	less than 0.001
2.200	less than 0.001
2.180	less than 0.001
2.120	less than 0.001
2.060	less than 0.001
3.780	less than 0.001
80.000	
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10.000	less than 0.001
10.000	less than 0.001
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5.000	
6.000	
80.000	
80.000	
70.000	
80.000	
50.000	
70.000	less than 0.001
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4.300	less than 0.001

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4.500	less than 0.001
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4.700	less than 0.001
4.500	less than 0.001
4.500	less than 0.001
5.000	less than 0.001
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4.500	less than 0.001
5.000	less than 0.001
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	less than 0.001
5.000	less than 0.001
5.100	less than 0.001
5.200	less than 0.001
5.000	less than 0.001
5.500	less than 0.001
5.000	less than 0.001
5.000	less than 0.001
4.500	less than 0.001
5.000	less than 0.001
5.000	less than 0.001
4.600	less than 0.001
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4.500	0.00
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5.900	less than 0.001
5.700	less than 0.001
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5.700	0.00
7.700	less than 0.001
8.500	0.00
5.600	less than 0.001
	less than 0.001

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76.900	less than 0.001
70.300	less than 0.001
66.800	
64.700	
62.900	less than 0.001
61.100	less than 0.001
61.800	less than 0.001
58.000	less than 0.001
56.800	less than 0.001
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54.300	less than 0.001
53.300	less than 0.001
53.700	less than 0.001
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50.000	less than 0.001
49.400	less than 0.001
48.700	less than 0.001
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44.600	less than 0.001
44.000	less than 0.001
43.500	less than 0.001
42.900	less than 0.001
44.000	less than 0.001
905.100	less than 0.001
499.300	less than 0.001
646.000	less than 0.001
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129.900	less than 0.001
133.000	less than 0.001
169.000	less than 0.001
58.700	less than 0.001
54.300	less than 0.001
54.000	less than 0.001
51.800	less than 0.001
56.500	less than 0.001
76.100	less than 0.001
107.100	less than 0.001
58.000	less than 0.001
57.600	less than 0.001

	71.500	less than 0.001
	57.200	less than 0.001
	100.100	less than 0.001
	79.400	less than 0.001
	60.800	less than 0.001
	57.000	less than 0.001
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	56.800	less than 0.001
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	47.900	less than 0.001
	47.300	less than 0.001
	46.700	less than 0.001
	46.100	less than 0.001
	46.300	less than 0.001
	44.800	less than 0.001
	44.400	less than 0.001
	44.000	less than 0.001
	43.800	less than 0.001
450.000		less than 0.001
	42.800	less than 0.001
450.000		less than 0.001
	42.500	less than 0.001
	42.600	less than 0.001
	42.000	less than 0.001
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440.000		less than 0.001
	41.300	less than 0.001
	41.000	less than 0.001
440.000		less than 0.001
	40.800	less than 0.001
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	40.600	less than 0.001
440.000		less than 0.001
	40.300	less than 0.001
440.000		less than 0.001
	40.100	less than 0.001
430.000		less than 0.001
	39.800	less than 0.001
430.000		less than 0.001

	39.700	
430.000		less than 0.001
	40.400	
430.000		less than 0.001
	39.300	
430.000		less than 0.001
	39.100	
420.000		less than 0.001
	38.900	
420.000		less than 0.001
	38.700	
420.000		less than 0.001
	39.000	
420.000		less than 0.001
	38.300	
410.000		less than 0.001
	38.200	
	420.000	less than 0.001
	38.100	
410.000		less than 0.001
	37.900	
410.000		less than 0.001
	38.200	
	410.000	less than 0.001
38.400		
410.000		less than 0.001
	37.700	
410.000		less than 0.001
	37.500	
410.000		less than 0.001
	37.300	
410.000		less than 0.001
	37.000	
410.000		less than 0.001
	38.000	
410.000		less than 0.001
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410.000		less than 0.001
	36.700	
410.000		less than 0.001
	36.500	
410.000		less than 0.001
	36.400	
410.000		less than 0.001
	38.300	
410.000		less than 0.001
	36.400	
410.000		less than 0.001
	36.500	
410.000		less than 0.001
	44.600	
410.000		less than 0.001
440.000	319.300	less than 0.001
650.000	189.700	less than 0.001
490.000	86.900	less than 0.001
480.000	144.200	less than 0.001

650.000	129.800	less than 0.001
650.000	123.900	less than 0.001
720.000	112.900	less than 0.001
600.000	73.600	less than 0.001
680.000	70.000	less than 0.001
820.000	68.800	less than 0.001
450.000	54.700	less than 0.001
430.000	47.600	less than 0.001
420.000	50.000	less than 0.001
420.000	42.900	less than 0.001
420.000		
	40.600	
400.000		less than 0.001
	39.900	
420.000		less than 0.001
	39.000	
420.000		less than 0.001
	41.300	
	41.300	
400.000		less than 0.001
420.000		less than 0.001
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400.000		less than 0.001
	38.100	
400.000		less than 0.001
	37.900	
		less than 0.001
	37.800	
		less than 0.001
	37.400	
		less than 0.001
	69.000	
	40.000	
	39.000	
287.200		
	75.000	
274.000		
	40.000	
268.000		0.00
304.800		
443.700		0.00
518.700		0.00
481.000		0.00
	87.083	
339.400		0.00
293.700		0.00
	48.899	
274.900		0.00
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269.400		0.00
	41.998	
266.800		0.00

[illegible]

0.01

less than 0.01

50.000

less than 0.01

[illegible]

less than 0.01

[illegible]

[illegible]

[illegible]

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[illegible]

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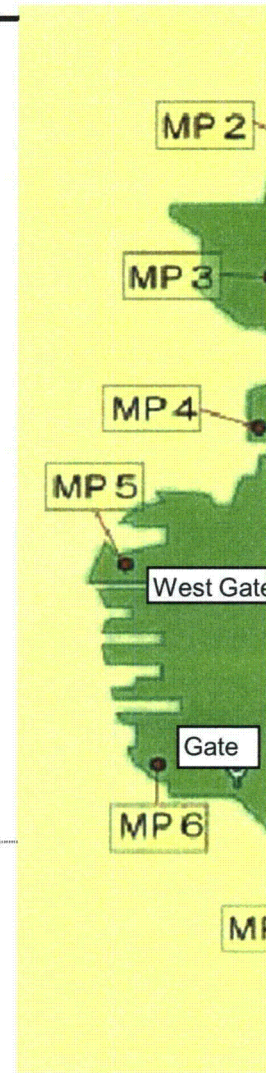
MP-5	MP-6	MP-8	Wind	Velocity m/s	Note
------	------	------	------	-----------------	------

1F-1 Vent 14:30-
Explosion

NE 0.4
NW 0.5
ENE 0.4
N 0.4
ENE 0.6
NE 0.5
NNW 0.5
N 0.6
W 0.7
N 0.8
WNW 0.4
N 0.3
N 0.4
NNE 0.4

1F-3 Vent 9:20-

SE 0.5
NE 2.0
NE 1.8
ENE 0.9
ENE 1.1
NNW 0.6
WSW 0.8
SW 0.7
WSW 0.7
NW 1.0
NNW 0.9
NNW 1.4
NNW 2.0
NW 1.7
W 0.9
W 1.0
W 0.6
WSW 0.5
NNW 0.4
NE 0.5



W	0.5
WSW	0.2
WNW	0.7
S	1.1
SE	0.9
SW	0.9
S	1.2
S	2.0
S	1.6
SE	2.5
SSE	2.8
S	1.9
SE	2.2
SE	2.0
N	1.8
N	2.0
N	1.7
SW	1.6
SW	2.7
NE	2.2
E	1.6
SW	2.0
NW	2.7
N	2.3
W	1.9

NW	2.2
SE	1.8
S	2.0
SW	1.7
E	1.7
S	2.6
E	2.6
SE	3.5
E	2.9
SSE	3.3
SSE	3.3
SSE	3.3
S	2.7
S	2.7
S	3.4
SSW	2.7
S	2.5
SSW	3.2
S	2.5
S	3.0
S	2.6
SSE	2.3
SSE	2.4
SSE	2.4
S	2.2
SSW	2.4
SSW	1.9
W	0.5
NW	0.4
W	0.3
W	0.5
SW	0.6
SW	0.5
NW	0.4
SW	0.4
W	0.4
W	0.4
W	0.3
S	0.4
N	0.4

	NW	0.4
	W	0.4
	W	0.5
	W	0.4
	NW	0.5
	NE	0.3
	NNW	0.4
	W	0.4
	S	0.4
	WNW	0.6
	NW	0.6
	SE	0.5
	NW	0.4
	W	0.4
	NE	0.6
	NE	0.5
	W	0.5
	W	0.5
	WNW	0.4
	WE	0.5
	S	0.6
	SW	0.7
	S	0.7
	S	1.2
	SE	1.5
	SSE	2.0
	S	1.6
	SW	1.2
	S	0.8
	SW	1.2
	S	1.3
	SSW	1.3
	S	0.6
	W	1.2
	NNE	0.7
	N	0.8
	N	0.7
	W	0.3
	NW	0.6
	W	0.6
	SE	0.5
	S	0.6
	S	0.9
	S	1.1
	SSW	0.9
	W	0.8
	SSW	1.3
	WNW	1.6
	N	0.9
	N	0.9
	MW	0.9
	NW	0.9

NW	0.4
S	0.4
E	0.5
E	0.5
SSE	1.6
SE	1.4
SE	2.0
SSE/ENE	2.4/0.5
E/WNW	1.5/0.8
SSW/WNW	1.4/1.8
N/NW	1.5/1.8
NW	2.3
NW	2.7
NW	3.1/2.6
NW	3.2/2.9
NNW/NW	4.2/2.3
N/NW	2.8/2.4
N/NW	3.3/2.8
NNW/NW	3.3/2.7
SE/NW	3.3/2.2
S/NNW	2.4/2.3
NW	2.8/2.5
NW	2.7/2.1
W/WNW	2.7/3.1
NNW/NW	2.5/2.4
E/NW	2.4/1.6
W/NW	2.2/1.3
S/NW	2.1/2.9
N/NW	2/2.3
SSW/NW	2.1/2.8
W/NNW	2.1/1.9
NW/NNW	2.1/2.3
SSW/WNW	2.6
S/WNW	2.7/2.5
SW/WNW	1.6/1.7
NNW/NW	2.2/1.6
SE/ENE	1.7/1.5
S	2.6/0.6
SSE/ESE	2.1/0.7
SSE/S	2.5/0.6
SSE	2.2/0.5
SE/SSE	1.6/0.7
SSE	2.0
SW/SSE	1.3/0.8
SSE/WNW	1.6/2.3
SSE/WNW	1.6/1.1
NW/ENE	2.0/2.1
WNW/ENE	1.5/1.1
SE/SSE	2.3/0.7
SE/SSE	2.2/0.7
S	1.8/0.4
S/SSE	1.8/0.4

SE/SSE	1.1/0.5
S/SSW	1.0/0.4
S/SE	1.0/0.5
SSW/SW	1.5/0.4
S/SW	1.8/0.4
SSE/WSW	0.6/0.5
NNW/SE	0.5/0.4
W/NNW	0.6/0.5
W/NNW	0.5/0.4
NW	0.6
NW/NNW	0.8/0.6
NW/NNE	0.9/0.3
NW/NNW	1.1/0.3
NW/N	1.3/0.3
NNW/NW	1.2/0.6
NW/NNW	1.0/0.5
W/NW	0.8/0.3
NW	0.8
NW	0.4
SW	0.8
WNW	0.4
W	0.6
N	0.3
W	0.5
NNW	0.5
NW	0.6
NW	0.5
SW	0.3
NW	0.6
NW	0.2
NNE	0.3
W	0.5
WNW	0.4
WNW	0.7
N	0.4
WNW	0.6
NNE	0.3
MW	0.8
N	0.4
N	0.5
N	0.4
N	0.5
NNW	0.4
W	0.5
NNW	0.3
S	0.3
NW	0.4
NW	0.3
N	0.3
N	0.3
NNE	0.3
W	0.5

NNW	0.3
N	0.3
NNW	0.5
WNW	0.4
ESE	0.3
NE	0.5
NNW	0.4
NW	0.4
N	0.5
N	0.5
NNW	0.3
N	0.7
NNW	0.3
N	0.3
NNW	0.4
WSW	0.6
ENE	0.4
W	0.4
NNW	0.3
W	0.5
NNW	0.3
W	0.5
NW	0.3
W	0.5
NW	0.3
W	0.4
N	0.3
N	0.4
NNW	0.3
W	0.4
N	0.5
S	0.5
SW	0.3
S	0.5
NNW	0.3
NW	0.4
NNE	0.3
S	0.3
SE	0.3
WNW	0.6
NW	0.3
WNW	0.6
NW	0.6
WNW	0.7
NNE	0.5
SE/E	0.7/0.4
NE/ESE	0.7/0.4
NW/NNW	0.5/0.4
S/NNW	0.4
SW/NNW	0.5/0.3
ENE/N	0.7/0.2
W/N	0.5/0.4

W/WNW	0.5/0.3
W/NNE	0.5/0.4
SE/WNW	0.4/0.3
S/W	0.4/0.5
S/NW	0.2/0.3
N/NNE	0.3/0.4
WNW/NNW	0.6/0.5
N/NW	0.9/0.5
ESE	0.6
NNW	0.7/0.4
N	0.8
NNW	0.6
SW	0.5
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SE	0.5
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WNW	1.3
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W	1.3
W	0.8
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W	0.8
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SE	1.1
S	0.8
SSW	0.5
S	1.0
S	1.0
SW	0.8
SSW	1.2
WNW	1.1
SW	1.3
NW	1.8
SW	1.3

NNW	2.1
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SSW	0.8
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NW	3.1
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WSW	3.2
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NW	2.6
NW	2.6
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N	2.2
NNE	2.6
WNW	3.2
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SE	0.8
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SE	1.0
SE	1.6
S	1.7
N	1.2
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NNE	4.8
NE	2.2
NE	2.1
N	2.2
N	2.2
NNW	1.8
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NE	0.6
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NNE	0.8

ENE	0.8
N	0.6
NW	0.5
NNW	0.5
NNE	0.7
NNW	1.3
NNE	1.1
N	1.0
NE	2.8
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NE	3.6
NNE	3.4
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NE	4.2
NNW	2.0
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NE	1.0
N	0.8
NE	0.9
NNW	0.7
N	0.7
N	0.8
NE	1.5
NE	1.5
N	1.6
N	1.8
NNE	1.5
NE	5.3
SE	1.2
E	1.3
ESE	3.4
SE	1.3
S	1.4
S	1.8
S	1.3
S	1.3
SSE	1.4
S	1.0
SSE	1.5
S	1.9
S	1.6
S	1.5
ESE	1.4
S	1.2
SSE	1.2

	E	1.2
	SE	1.2
	S	1.0
	SE	1.1
	S	1.1
	SE	1.1
	SSE	1.3
	S	1.0
	SSE	1.4
	S	1.1
	SSE	1.1
	SSE	1.3
	S	1.3
	SE	1.5
	S	1.1
	SE	1.2
	S	1.1
	S	1.0
	S	1.1
	S	1.0
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	S	0.9
	E	0.9
	NW	1.0
	NW	3.7
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	NNE	2.5
	NW	2.1
	N	2.4
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	NE	3.8
	N	1.1
	NW	2.2
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	NNW	0.9
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	NW	1.0
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	NW	1.0
	NW	5.0
	N	4.2

NNW	3.1
NW	2.9
NNW	2.6
NW	2.0
W	1.4
WNW	1.4
WNW	1.4
NW	1.4
NW	1.4
NW	1.2
NW	1.3
W	1.2
W	1.2
NNW	1.2
WNW	1.3
NNW	1.4
NNW	1.4
N	1.7
NNW	2.2
NW	1.7
N	2.3
NW	1.8
NW	1.9
W	1.6
NNW	1.5
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NW	1.5
ENE	1.4
E	2.2
ENE	4.9
NE	
NE	2.0
NNE	1.9
ENE	2.3
NE	1.6
E	1.8
N	1.8
ESE	1.6
E	0.9
N	1.8
ENE	1.4
W	1.4
NW	4.1
WSW	3.0
WSW	1.0
WSW	1.2
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NW	2.7
NW	2.1
ENE	1.7
SSW	1.9

	SSE	2.3
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	WNW	2.1
	WSW	3.1
	NW	2.3
	NW	3.4
	NNW	3.0
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NW	0.5
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NNE	0.2
NW	0.2
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N	3.0
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WNW	3.1

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W	1.9
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NW	1.3
SW	1.5
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	S	1.2
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WNW	0.4
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WSW	0.3
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NR	0.9
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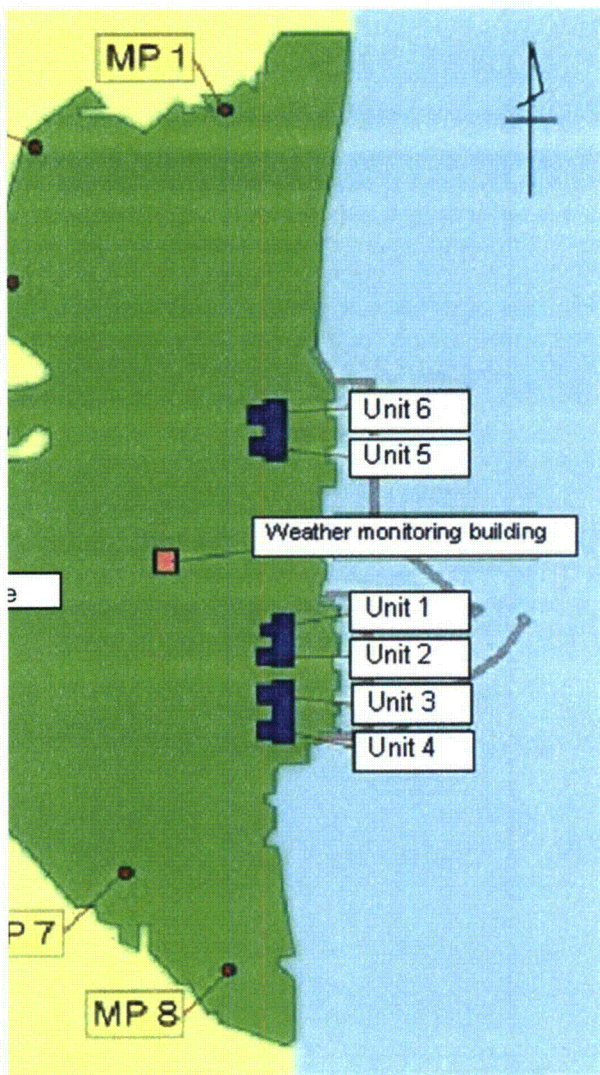
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WSW	5.9
WSW	6.1
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W	4.3
W	5.1
SSW	4.9
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NE	3.4
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SSW	3.1
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SW	4.6
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NW	2.4
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W	5.0
WSW	4.5
WSW	6.1
W	5.1
W	5.7
W	4.5
NW	4.1
W	3.3
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W	2.7
W	2.8
W	4.1
W	3.5
W	4.4
WSW	4.1
WSW	3.2
WSW	2.7
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W	2.7
W	2.2

W	2.6
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W	2.6
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WSW	0.8
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NW	3.2
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NE	2.9
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W	1.8
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NW	2.3
WNW	2.1
WSW	1.0
NE	1.1
NNE	1.0
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W	0.9
NW	0.5
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SW	1.7
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SW	2.4
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SW	2.0
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NNW	0.8
NE	1.2
NW	1.2
W	1.4
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NW	1.6
WNW	1.2
W	1.0
WNW	2.0
W	2.2
WNW	2.4
W	2.4
W	2.0
WNW	2.0
WNW	2.2
NW	1.6

	NW	2.2
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	NW	3.2
	W	1.2
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	WNW	0.8
	W	1.0
	WNW	1.2
	W	1.0
	W	0.8
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	W	0.8
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	W	0.8
	W	0.6
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	NW	0.7
	NW	0.8
	NW	0.5
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	NW	0.8
	NW	1.0
	N	1.0
	W	0.6
	ESE	0.5
	WNW	0.8
	W	0.8
	NW	0.7
	NW	0.7
	WNW	1.1
	WNW	0.8



From: Scott, Michael
Sent: Thursday, April 07, 2011 12:02 PM
To: LIA03 Hoc
Subject: RE: Dosimeter Numbers

Now that I'm back from Japan, can you please inform me:

1. To whom do I turn in my dosimeter.
2. To whom do I turn in my laptop.
3. To whom do I turn in my international blackberry.
4. To whom do I turn in my phone card.

Thanks!

From: LIA03 Hoc
Sent: Tuesday, March 22, 2011 7:56 PM
To: Liaison Japan
Cc: O'Donnell, John
Subject: Dosimeter Numbers

Dear Team – When you get the chance, please email the International Liaison Team your dosimeter number. In our haste to get you out to Japan, we neglected to get that information from you and the RSO needs it for NRC records. In addition, if you are planning to stay past the end of March, please let us know, as we will need to get you a new dosimeter. The ones you have now are only for use during the second quarter.

Thank you for your help.
The International Liaison Team

KICKK-149

From: ET02 Hoc
Sent: Thursday, April 07, 2011 9:57 AM
To: ET07 Hoc
Subject: FW: ACTION: Forward data to Triage
Attachments: AF-Summary-sent-APR-7-2011.xls; In-Situ_Summary-Apr-7-2011 .xls

From: ET01 Hoc
Sent: Thursday, April 07, 2011 9:56:33 AM
To: ET02 Hoc
Subject: FW: ACTION: Forward data to Triage
Auto forwarded by a Rule

From: Sheron, Brian
Sent: Thursday, April 07, 2011 9:56:33 AM
To: PMT01 Hoc; ET01 Hoc
Subject: FW: ACTION: Forward data to Triage
Auto forwarded by a Rule

FYI.

From: NITOPS [mailto:NITOPS@nnsa.doe.gov]
Sent: Thursday, April 07, 2011 9:42 AM
To: Aoki, Steven; Aragon, Antonio; Aragon, Antonio; Binkley, Steve; Budnitz, Bob; Casson, William (Bill); Dudder, Gordon B; Garwin, Dick (EOP); Garwin, Dick (IBM); Green, Stephen; Myers, Steven; NITOPS; NITSolutions; Peterson, Per; Pitts, William Karl; Poneman, Daniel; Sheron, Brian; Spanard, Richard J.; Swanson, Joel (LLNL); Szilard, Ronaldo; Szymanski, John ; Valentine-Davis, Victor; Wimer, Nathan; Wimer, Nathan; Woessner, William S.
Cc: NITOPS; Aragon, Antonio; Wallace Jr., James F.; Aragon, Antonio
Subject: FW: ACTION: Forward data to Triage

Forwarded for your action.

Perry
NITOPS

From: Fournier, Sean Donovan [mailto:sdfourn@sandia.gov]
Sent: Thursday, April 07, 2011 9:35 AM
To: NITOPS
Cc: CMHT; Wimer, Nathan; Marianno, Craig (CONTR); Shanks, Sonoya T
Subject: ACTION: Forward data to Triage

Updated sample information is attached, please forward to Triage

-Sean D. Fournier

KKKK-150

Sandia National Laboratories
Radiation Protection and Sample Diagnostics (RPSD) 4121
Staff Augmentation
Laboratory Support
Bld. 1090/144
MS 1103
Office: (505)844.7838
Fax: (505)844.0112

Sample#	Event	Sample In	Field Team	Collection
HPGE_2011_03_19_1944_pst_C_12_Altitude_Spiral	Japan Earth		AMS C-12	3/19/2011
HPGE_2011_03_19_2000_lines_near_Ryo-zen	Japan Earth		AMS C-12	3/19/2011
HPGe_2011_03_19_2040_Sendia_Jap_C12_All_Lines	Japan Earth		AMS C-12	3/19/2011
HPGE_2011_03_22_0001pst_C12_Spiral_Data_All	Japan Earth		AMS C-12	3/22/2011
HPGE_2011_03_22_0001pst_C12_Spiral_Data_All	Japan Earth		AMS C-12	3/22/2011
HPGE_2011_03_22_1700_pst_C12_Alt_Spiral_Grd	Japan Earth		AMS C-12	3/22/2011
HPGE_2011_03_22_1826_pst_C12_Sukagawa_all_lines	Japan Earth		AMS C-12	3/22/2011
HPGE_2011_03_22_1940_pst_C12_Iwaki_all_lines.zip	Japan Earth		AMS C-12	3/27/2011
HPGe_2011_03_24_2030_Kawauchi_C12_All_Lines	Japan Earth		AMS C-12	3/24/2011
HPGe_2011_03_25_1850_Musashimurayama_C12_All_Lines	Japan Earth		AMS C-12	3/25/2011
HPGe_2011_03_25_1937_pst_Fukushima_C12_OnGrd	Japan Earth		AMS Helo	3/25/2011
HPGE_2011_03_25_2100_pst_ground_Kasuminome_AB_2.	Japan Earth		AMS Helo	3/25/2011
HPGE_2011_03_25_2119_pst_Helo_over_Matsushima.Spc	Japan Earth		AMS Helo	3/25/2011
HPGE_2011_03_25_2230_pst_Helo_over_Iwanuma.zip	Japan Earth		AMS Helo	3/25/2011
HPGE_2011_03_25_2330_pst_over_Haramachi.zip	Japan Earth		AMS Helo	3/25/2011
HPGE_2011_03_25_pst_ground_testline_etc_Helo.zip	Japan Earth		AMS Helo	3/25/2011
HPGE_2011_03_25_pst_Various_Cities_Helo.zip	Japan Earth		AMS Helo	3/25/2011
SCF-10001	Japan Earth	Ortec, Det	Alpha 2011	3/21/2011
SCF-10002	Japan Earth	Ortec, Det	Alpha 2011	3/21/2011
SCF-10003	Japan Earth	Ortec, Det	Alpha 2011	3/22/2011
SCF-10004	Japan Earth	Ortec, Det	Alpha 2011	3/22/2011
SCF-10005	Japan Earth	Ortec, Det	Alpha 2011	3/22/2011
SCF-10006	Japan Earth	Ortec, Det	Alpha 2011	3/22/2011
SCF-10007	Japan Earth	Ortec, Det	CMOC Bui	3/17/2011
SCF-10009	Japan Earth	Ortec, Det	Delta 2011	3/23/2011
SCF-10010	Japan Earth	Ortec, Det	Delta 2011	3/23/2011
SCF-10011	Japan Earth	Ortec, Det	Alpha 2011	3/23/2011
SCF-10012	Japan Earth	Ortec, Det	Alpha 2011	3/23/2011
SCF-10013	Japan Earth	Ortec, Det	Alpha 2011	3/23/2011
SCF-10014	Japan Earth	Ortec, Det	CMOC Bui	3/24/2011
SCF-10014-D1	Japan Earth	Ortec, Det	Delta 2011	3/25/2011
SCF-10015	Japan Earth	Ortec, Det	Delta 2011	3/25/2011
SCF-10016	Japan Earth	Ortec, Det	Alpha 2011	3/26/2011
SCF-10017	Japan Earth	Ortec, Det	Alpha 2011	3/26/2011
SCF-10018	Japan Earth	Ortec, Det	Alpha 2011	3/27/2011
SCF-10019	Japan Earth	Ortec, Det	Alpha 2011	3/29/2011
SCF-10020	Japan Earth	Ortec, Det	Delta 2011	3/28/2011
SCF-10021	Japan Earth	Ortec, Det	Alpha 2011	3/29/2011
SCF-10022	Japan Earth	Ortec, Det	Alpha 2011	3/29/2011
SCF-10023	Japan Earth	Ortec, Det	Alpha 2011	3/29/2011
SCF-10024	Japan Earth	Ortec, Det	Delta 2011	3/30/2011
SCF-10025	Japan Earth	Ortec, Det	Delta 2011	3/31/2011
SCF-10026	Japan Earth	Ortec, Det	Alpha 2011	3/31/2011
SCF-10027	Japan Earth	Ortec, Det	Alpha 2011	3/31/2011
SCF-10028	Japan Earth	Ortec, Det	Alpha 2011	4/1/2011 9
SCF-10029	Japan Earth	Ortec, Det	Alpha 2011	4/1/2011 9
SCF-10030	Japan Earth	Ortec, Det	Alpha 2011	4/1/2011 1
SCF-10031	Japan Earth	Ortec, Det	Alpha 2011	4/1/2011 1
SCF-10032	Japan Earth	Ortec, Det	Alpha 2011	4/1/2011 1
SCF-10033	Japan Earth	Ortec, Det	Alpha 2011	4/1/2011 1

SCF-10034	Japan Earthquake	Ortec, Detector	Delta 2011	4/2/2011 8
SCF-10035	Japan Earthquake	Ortec, Detector	Delta 2011	4/2/2011 9
SCF-10036	Japan Earthquake	Ortec, Detector	Delta 2011	4/2/2011 10
SCF-10037	Japan Earthquake	Ortec, Detector	Delta 2011	4/2/2011 11
SCF-10038	Japan Earthquake	Ortec, Detector	Alpha 2011	4/2/2011 6
SCF-10039	Japan Earthquake	Ortec, Detector	Alpha 2011	4/2/2011 7
SCF-10040	Japan Earthquake	Ortec, Detector	Alpha 2011	4/2/2011 1
SCF-10041	Japan Earthquake	Ortec, Detector	Alpha 2011	4/3/2011 1
SCF-10042	Japan Earthquake	Ortec, Detector	Alpha 2011	4/3/2011 5
SCF-10043	Japan Earthquake	Ortec, Detector	Alpha 2011	4/3/2011 5
SCF-10044	Japan Earthquake	Ortec, Detector	Alpha 2011	4/3/2011 6
SCF-10045	Japan Earthquake	Ortec, Detector	Alpha 2011	4/3/2011 7
SCF-10045-D1	Japan Earthquake	Ortec, Detector	Delta 2011	4/3/2011 7
SCF-2011_03_17_17_10_160 Buf00063-FIS-9Aspectra	Japan Earthquake	test, test	□	3/20/2011
SCF-2011_03_17_17_59_380 Buf00061-FIS-9A SN4639Spe	Japan Earthquake	test, test	□	3/17/2011

Latitude	Longitude	File Name	Instrument	Sampling	Live Time	Exposure
35.8	139.4	HPGE 2011_03_19_1944_pst_C12	HPGE 201			
37.4557	140.4157	HPGE_C12_2011_03_19_2000_lines	HPGE_C12			
38.1542	140.5359	HPGE_C12_2011_03_19_2040_pst	HPGE_C12			
35.2831	139.2256					
35.2831	139.2256	HPGE_C12_Spiral_Data_2011_03_22	HPGE_C12			
35.73333	139.3333	HPGE 2011_03_22_1700_pst_C12	HPGE 201			
37.2895	140.39	HPGE 2011_03_22_1826_pst_C12	HPGE 201			
37.08333	140.8333	HPGE 2011_03_22_1940_pst_C12	HPGE 201			
37.1636	140.5359	HPGe 2011_03_24_2030_Kawauchi	HPGe 201			
35.4519	139.2243	HPGe 2011_03_25_1850_Musashin	HPGe 201			
37.45576	140.2747	HPGe 2011_03_25_1937_pst_Fukus	HPGe 201			
38.1408	140.5523	HPGE 2011_03_26_2100_pst_groun	HPGE 201			
38.36667	141.0717	HPGE 2011_03_26_2119_pst_Helo	HPGE 201			
38.1047	140.8594	HPGE 2011_03_26_2230_pst_over	HPGE 201			
33.7667	132.7833	HPGE 2011_03_26_2330_pst_over	HPGE 201			
1	1	HPGE 2011_03_25_pst_ground_tes	HPGE 201			
1	1	HPGE 2011_03_25_pst_Various_Cit	HPGE 201			
37.29096	140.3527	2011_03_21_15_01_510.spc	2011_03_2	1070	1070	0
37.36525	140.314	2011_03_22_15_36_SCF-1002.n42	2011_03_2	1130	1130	0
37.48811	140.3785	2011_03_22_16_11_250.n42	2011_03_2	1003	1003	0
37.59021	140.4199	2011_03_22_16_43_510.n42	2011_03_2	1002	1002	0
37.44244	140.5247	2011_03_22_17_35_500.n42	2011_03_2	1004	1004	0
37.29076	140.6147	2011_03_22_18_14_120.n42	2011_03_2	1001	1001	90
35.74106	139.3609	2011_03_17_17_03_570_Buf00065-F	2011_03_1			
36.86811	140.7421	2011_03_23_15_00_130.n42	2011_03_2	1050	1050	
37.35289	140.9789	2011_03_23_16_33_020.spc	2011_03_2			
37.5902	140.4199	2011_03_24_14_05_520_SCF-10011	2011_03_2	1005	1005	0
37.43317	140.3444	2011_03_24_14_59_540_SCF-10012	2011_03_2	1133	1133	0
37.2909	140.3527	2011_03_24_15_45_590_SCF-10013	2011_03_2	1007	1007	0
35.74124	139.3603	2011_03_25_15_55_530_SCF10014	2011_03_2	1017	1017	0
36.25553	140.5508	--		1003	1003	0
35.95601	140.589	2011_03_25_17_26_210_SCF10015	2011_03_2	1002	1002	0
36.9993	140.822	2011_03_27_12_54_450.spc	2011_03_2	1012	1012	0
36.79806	140.7282	2011_03_27_14_01_SCF-10017.spc	2011_03_2	1016	1016	0
36.51034	140.5777	2011_03_27_15_05_SCF-10018.spc	2011_03_2	1000	1000	43
36.18893	139.5808	2011_03_30_10_40_260.spc	2011_03_3	1000	1000	0
36.72594	139.7877	2011_03_29_11_57_SCF-10019.n42	2011_03_2	1000	1000	0
36.68788	139.8889	2011_03_30_11_56_590.n42	2011_03_3	1000	1000	0
37.15164	140.2423	2011_03_30_12_58_010.n42	2011_03_3	1000	1000	0
37.73885	140.4228	2011_03_30_14_15_400.n42	2011_03_3	1000	1000	0
36.29246	140.5594	2011_03_31_14_58_400.spc	2011_03_3	1002	1002	0
35.99632	140.6437	2011_03_31_16_33_000.spc	2011_03_3	1002	1002	0
35.76015	140.7983	2011_04_01_12_36_130.n42	2011_04_0	1011	1011	0
36.46025	140.5969	2011_04_01_15_51_160.n42	2011_04_0	1003	1003	0
37.28212	140.2546	--		1003	1003	0
37.2841	140.2489	--		1003	1003	0
37.28591	140.2441	--		1002	1002	0
37.2863	140.2386	--		1002	1002	0
37.28846	140.2226	--		1002	1002	0
37.28742	140.2324	--		1001	1001	0

35.29389	139.6722	--		1000	1000	0
35.28388	139.674	--		1005	1005	0
0	0	--		1003	1003	0
35.28681	139.6629	--		1002	1002	0
35.45756	139.4353	--		1234	1243	0
35.44492	139.4579	--		1000	1000	0
35.49497	139.3954	--		1000	1000	0
35.51214	139.396	--		1004	1004	0
35.74657	139.36	2011_04_04_09_10_000.n42	2011_04_0	1006	1006	0
35.75481	139.3393	2011_04_04_09_47_070.n42	2011_04_0	1000	1000	0
35.74324	139.3385	2011_04_04_10_25_050.n42	2011_04_0	1000	1000	0
35.72674	139.3488	2011_04_04_11_02_330.n42	2011_04_0	1000	1000	0
35.31393	138.8662	2011_04_04_10_58_230.n42	2011_04_0	1002	1002	0

[illegible]

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	0	100
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	0	100
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	0	100
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	0	100

Sample#	Field Team	Collection Date	Latitude	Longitude
	CMOC Building 1503 []	3/21/2011 7:10:00 PM	35.74103	139.3609
SCF-00001	Delta 2011-03-21 Expressway	3/21/2011 4:34:57 PM	37.35416	140.3229
SCF-00003	Alpha 2011-03-22 Expressway	3/22/2011 2:43:00 PM	37.29096	140.3527
SCF-00004	Delta 2011-03-22 Chiba []	3/22/2011 12:14:56 PM	35.61171	140.0641
SCF-00005	Delta 2011-03-22 Chiba []	3/22/2011 12:14:29 PM	35.61171	140.0641
SCF-00006	Delta 2011-03-22 Chiba []	3/22/2011 12:00:07 PM	35.81314	140.4041
SCF-00007	Delta 2011-03-22 Chiba []	3/22/2011 12:00:18 PM	35.81314	140.4041
SCF-00008	Delta 2011-03-22 Chiba []	3/22/2011 2:54:01 PM	35.99686	140.6423
SCF-00009	CMOC Building 1503 []	3/18/2011 9:41:00 AM	35.74106	139.3609
SCF-00011	CMOC Building 1503 []	3/19/2011 8:40:00 AM	35.74106	139.3609
SCF-00012	CMOC Building 1503 []	3/19/2011 8:40:00 AM	35.74106	139.3609
SCF-00013	Bravo 2011-03-18 Embassy []	3/19/2011 12:50:29 PM	35.66871	139.7433
SCF-00013-D1	Bravo 2011-03-19 Embassy []	3/18/2011 8:48:39 PM	35.6687	139.7433
SCF-00014	Bravo 2011-03-19 Embassy []	3/19/2011 9:08:00 PM	35.6687	139.7433
SCF-00015	Bravo 2011-03-18 Embassy []	3/19/2011 12:50:00 PM	35.6687	139.7433
SCF-000153	Alpha 2011-03-23 Expressway	3/22/2011 11:44:43 PM	36.54924	140.3313
SCF-00016	Bravo 2011-03-19 Embassy []	3/19/2011 1:50:00 PM	35.66711	139.7371
SCF-00017	Bravo 2011-03-19 Embassy []	3/19/2011 2:00:00 PM	35.66711	139.7371
SCF-00018	Bravo 2011-03-19 Embassy []	3/19/2011 1:50:00 PM	35.74151	139.3602
SCF-00021	CMOC Building 1503 []	3/20/2011 8:45:00 AM	35.74106	139.3609
SCF-00022	CMOC Building 1503 []	3/20/2011 11:16:56 PM	35.74106	139.3609
SCF-00023	Bravo 2011-03-20 Embassy []	3/20/2011 11:35:00 AM	35.66872	139.7433
SCF-00024	Bravo 2011-03-20 Embassy []	3/19/2011 7:51:42 PM	35.66872	139.7433
SCF-00025	Bravo 2011-03-20 Embassy []	3/20/2011 12:05:00 PM	35.66872	139.7433
SCF-00026	Bravo 2011-03-20 Embassy []	3/20/2011 8:58:00 PM	35.66709	139.7371
SCF-00027	Bravo 2011-03-20 Embassy []	3/20/2011 9:04:00 PM	35.66709	139.7371
SCF-00028	Bravo 2011-03-20 Embassy []	3/20/2011 9:17:00 PM	35.66709	139.7371
SCF-00029	Alpha 2011-03-19 H60 Helo Te	3/19/2011 2:12:00 PM	37.22255	140.43
SCF-00030	Bravo 2011-03-21 Embassy []	3/21/2011 12:45:42 PM	35.66709	139.7371
SCF-00031	Bravo 2011-03-21 Embassy []	3/21/2011 12:45:00 PM	35.66485	139.7432
SCF-00034	Bravo 2011-03-22 Embassy []	3/22/2011 2:10:01 PM	35.74151	139.3602
SCF-00035	Bravo 2011-03-21 Embassy []	3/21/2011 1:25:00 PM	35.66709	139.7371
SCF-00036	Bravo 2011-03-21 Embassy []	3/21/2011 1:25:00 PM	35.66709	139.7371
SCF-00037	Bravo 2011-03-22 Embassy []	3/22/2011 2:10:20 PM	35.74151	139.3602
SCF-00038	Bravo 2011-03-21 Embassy []	3/21/2011 4:25:00 PM	35.66866	139.7433
SCF-00040	Alpha 2011-03-16 Embassy []	3/16/2011 1:55:00 PM	35.66852	139.7434
SCF-00041	AMS Helo Flight []	3/20/2011 1:02:00 PM		
SCF-00042	AMS Helo Flight []	3/20/2011 1:02:00 PM		
SCF-00043	AMS C-12 Flight []	3/20/2011 12:02:00 PM		
SCF-00044	AMS C-12 Flight []	3/20/2011 12:02:00 PM		
SCF-00045	CMOC Building 1503 []	3/16/2011 7:00:00 PM	35.74103	139.3609
SCF-00046	CMOC Building 1503 []	3/21/2011 7:30:00 AM	35.74103	139.3609
SCF-00047	CMOC Building 1503 []	3/21/2011 7:30:50 AM	35.74103	139.3609
SCF-00048	CMOC Building 1503 []	3/16/2011 7:35:00 AM	35.74103	139.3609
SCF-00049	Alpha 2011-03-19 H60 Helo Te	3/19/2011 2:59:00 PM	37.6965	140.9717
SCF-0004-D1	Delta 2011-03-22 Chiba []	3/21/2011 8:26:26 PM	35.61171	140.0641
SCF-00050	Alpha 2011-03-19 H60 Helo Te	3/19/2011 2:59:00 PM	37.6965	140.9717
SCF-00051	Alpha 2011-03-19 H60 Helo Te	3/19/2011 4:24:00 PM	37.40535	140.6878
SCF-00052	Bravo 2011-03-21 Embassy []	3/21/2011 4:25:00 PM	35.66866	139.7433

SCF-00053	Bravo 2011-03-22 Embassy []	3/22/2011 12:55:56 PM	35.66873	139.7433
SCF-00054	Bravo 2011-03-22 Embassy []	3/22/2011 12:55:54 PM	35.66873	139.7433
SCF-00055	Bravo 2011-03-24 Embassy []	3/24/2011 1:42:02 AM	35.66711	139.7371
SCF-00056	Bravo 2011-03-24 Embassy []	3/24/2011 1:44:37 AM	35.66711	139.7371
SCF-00057	Alpha 2011-03-20 Expressway	3/20/2011 5:48:00 PM	37.23558	140.9853
SCF-00058	Alpha 2011-03-20 Expressway	3/20/2011 5:48:00 PM	37.23558	140.9853
SCF-00060	Alpha 2011-03-20 Expressway	3/20/2011 6:26:00 PM	37.06876	140.8429
SCF-00061	Alpha 2011-03-20 Expressway	3/20/2011 6:26:00 PM	37.68762	140.8429
SCF-00062	Alpha 2011-03-22 Expressway	3/22/2011 12:00:00 PM	37.29096	140.3527
SCF-00063	Alpha 2011-03-22 Expressway	3/22/2011 3:37:32 PM	37.36525	140.314
SCF-00064	[]	3/22/2011 3:37:00 PM	37.36525	140.314
SCF-00065	Alpha 2011-03-22 Expressway	3/22/2011 4:14:09 PM	37.48811	140.3785
SCF-00066	Alpha 2011-03-22 Expressway	3/22/2011 4:14:00 PM	37.48811	140.3785
SCF-00067	Alpha 2011-03-22 Expressway	3/22/2011 5:38:06 PM	37.44244	140.5247
SCF-00068	Alpha 2011-03-22 Expressway	3/22/2011 5:38:00 PM	37.44244	140.5247
SCF-00069	Alpha 2011-03-22 Expressway	3/22/2011 4:46:09 PM	37.59021	140.4199
SCF-00070	Alpha 2011-03-22 Expressway	3/22/2011 4:46:00 PM	37.59021	140.4199
SCF-00071	Alpha 2011-03-22 Expressway	3/22/2011 6:17:10 PM	37.29076	140.6147
SCF-00072	Alpha 2011-03-22 Expressway	3/22/2011 6:17:00 PM	37.29076	140.6147
SCF-00073	Alpha 2011-03-22 Expressway	3/22/2011 10:29:00 AM		
SCF-00081	CMOC Building 1503 []	3/21/2011 1:52:04 PM	35.74103	139.3609
SCF-00082	CMOC Building 1503 []	3/21/2011 1:42:56 PM	35.74103	139.3609
SCF-00083	AMS Helo Flight []	3/22/2011 5:39:00 PM		
SCF-00084	AMS Helo Flight []	3/22/2011 5:39:00 PM		
SCF-00085	Delta 2011-03-22 Chiba []	3/22/2011 2:54:00 PM	35.99686	140.6423
SCF-00086	Delta 2011-03-22 Chiba []	3/22/2011 3:58:00 PM	36.25571	140.5507
SCF-00087	Delta 2011-03-22 Chiba []	3/22/2011 3:58:58 PM	36.25571	140.5507
SCF-00088	Delta 2011-03-22 Chiba []	3/22/2011 4:42:11 PM	36.27402	140.4584
SCF-00089	Delta 2011-03-22 Chiba []	3/22/2011 4:42:08 PM	36.27402	140.4584
SCF-00089-D1	Alpha 2011-04-03 Zama, Atsugi	4/3/2011 1:05:05 AM	35.49502	139.3954
SCF-00090	Alpha 2011-03-21 Expressway	3/21/2011 1:27:42 PM	37.12482	140.9478
SCF-00091	Alpha 2011-03-21 Expressway	3/21/2011 1:27:00 PM	37.12425	140.9481
SCF-00092	Alpha 2011-03-21 Expressway	3/21/2011 2:01:24 PM	37.06753	140.8383
SCF-00093	Alpha 2011-03-21 Expressway	3/21/2011 2:01:00 PM	37.06801	140.8384
SCF-00094	Alpha 2011-03-21 Expressway	3/21/2011 2:32:50 PM	37.00189	140.8126
SCF-00095	Alpha 2011-03-21 Expressway	3/21/2011 2:32:00 PM	37.00197	140.8126
SCF-00096	Alpha 2011-03-21 Expressway	3/21/2011 3:03:31 PM	36.90324	140.7517
SCF-00097	Alpha 2011-03-21 Expressway	3/21/2011 3:03:00 PM	36.903	140.7516
SCF-00098	Alpha 2011-03-21 Expressway	3/21/2011 3:37:35 PM	36.7973	140.7266
SCF-00099	Alpha 2011-03-21 Expressway	3/21/2011 3:37:00 PM	36.79726	140.7264
SCF-00107	CMOC Building 1503 []	3/21/2011 2:45:00 PM	35.74103	139.3609
SCF-00108	CMOC Building 1503 []	3/21/2011 2:45:00 PM	35.74103	139.3609
SCF-00109	CMOC Building 1503 []	3/21/2011 3:45:00 PM	35.74103	139.3609
SCF-00109 Paper	CMOC Building 1503 []	3/21/2011 3:45:00 PM	35.74103	139.3609
SCF-00110	CMOC Building 1503 []	3/21/2011 3:45:00 PM	35.74106	139.3609
SCF-00111	CMOC Building 1503 []	3/21/2011 7:10:00 PM	35.74098	139.3609
SCF-00112	CMOC Building 1503 []	3/21/2011 7:10:00 PM	35.74103	139.3609
SCF-00113	Alpha 2011-03-21 Expressway	3/21/2011 3:40:00 PM		
SCF-00114	CMOC Building 1503 []	3/21/2011 11:00:00 PM	35.74098	139.3609
SCF-00115	CMOC Building 1503 []	3/21/2011 11:00:00 PM	35.74098	139.3609
SCF-00116	CMOC Building 1503 []	3/22/2011 3:00:00 PM	35.74098	139.3609

SCF-00117	CMOC Building 1503 []	3/22/2011 3:00:00 AM	35.74098	139.3609
SCF-00118	CMOC Building 1503 []	3/22/2011 7:00:00 AM	35.74113	139.361
SCF-00119	CMOC Building 1503 []	3/22/2011 7:00:00 AM	35.74113	139.361
SCF-00120	CMOC Building 1503 []	3/22/2011 11:00:00 AM	35.74098	139.3609
SCF-00121	CMOC Building 1503 []	3/22/2011 3:53:00 PM	35.74098	139.3609
SCF-00124	Bravo 2011-03-23 Embassy []	3/23/2011 1:00:00 PM	35.66874	139.7433
SCF-00125	Bravo 2011-03-23 Embassy []	3/23/2011 1:00:00 PM	35.66874	139.7433
SCF-00126	Bravo 2011-03-23 Embassy []	3/23/2011 2:00:00 PM	35.66715	139.737
SCF-00127	Bravo 2011-03-23 Embassy []	3/23/2011 2:00:00 PM	35.66715	139.737
SCF-00128	Bravo 2011-03-24 Embassy []	3/24/2011 11:58:00 PM	35.66865	139.7433
SCF-00129	Bravo 2011-03-24 Embassy []	3/24/2011 12:01:42 AM	35.66865	139.7433
SCF-00130	CMOC Building 1503 []	3/22/2011 3:12:00 PM	35.74098	139.3609
SCF-00131	CMOC Building 1503 []	3/22/2011 3:12:00 PM	35.74098	139.3609
SCF-00132	CMOC Building 1503 []	3/22/2011 4:04:00 PM	35.74098	139.3609
SCF-00133	CMOC Building 1503 []	3/22/2011 4:07:00 PM	35.74098	139.3609
SCF-00134	CMOC Building 1503 []	3/23/2011 4:48:00 PM	35.74098	139.3609
SCF-00135	CMOC Building 1503 []	3/23/2011 5:12:00 PM	35.74098	139.3609
SCF-00136	CMOC Building 1503 []	3/23/2011 12:20:00 PM	35.74098	139.3609
SCF-00137	CMOC Building 1503 []	3/23/2011 12:25:00 PM	35.74098	139.3609
SCF-00139	Delta 2011-03-23 Expressway	3/23/2011 2:43:00 PM	36.86811	140.7421
SCF-00140	Delta 2011-03-23 Expressway	3/23/2011 2:43:00 PM	36.86811	140.7421
SCF-00142	Delta 2011-03-23 Expressway	3/23/2011 3:43:51 PM	37.35289	140.9789
SCF-00143	Delta 2011-03-23 Expressway	3/23/2011 4:03:39 PM	37.35289	140.9789
SCF-00149	Alpha 2011-03-23 Expressway	3/23/2011 1:52:13 PM	36.79673	140.7271
SCF-00150	Alpha 2011-03-23 Expressway	3/23/2011 1:52:33 PM	36.79673	140.7271
SCF-00151	Alpha 2011-03-23 Expressway	3/23/2011 2:29:00 PM	36.60209	140.6374
SCF-00152	Alpha 2011-03-23 Expressway	3/23/2011 2:29:46 PM	36.60209	140.6374
SCF-00153	Alpha 2011-03-23 Expressway	3/23/2011 3:54:00 PM	36.54923	140.3313
SCF-00154	Alpha 2011-03-23 Expressway	3/23/2011 3:54:00 PM	36.54924	140.3313
SCF-00155	Alpha 2011-03-24 Expressway	3/24/2011 2:01:00 PM	37.5902	140.4199
SCF-00156	Alpha 2011-03-24 Expressway	3/24/2011 2:01:00 PM	37.5902	140.4199
SCF-0018-D1	Alpha 2011-03-19 H60 Helo Te	3/18/2011 10:22:07 PM	37.40535	140.6878
SCF-00200	AMS Helo Filght []	3/23/2011 1:31:00 PM		
SCF-00201	AMS Helo Filght []	3/23/2011 1:31:00 PM		
SCF-00202	AMS C-12 Flight []	3/23/2011 8:32:00 AM		
SCF-00202	AMS C-12 Flight []	3/23/2011 8:32:00 AM		
SCF-00203	AMS C-12 Flight []	3/23/2011 8:32:00 AM		
SCF-00204	Alpha 2011-03-24 Expressway	3/24/2011 3:02:00 PM	37.43317	140.3444
SCF-00205	Alpha 2011-03-24 Expressway	3/24/2011 3:02:00 PM	37.43317	140.3444
SCF-00206	Alpha 2011-03-24 Expressway	3/24/2011 3:50:00 PM	37.2909	140.3527
SCF-00207	Alpha 2011-03-24 Expressway	3/24/2011 3:50:00 PM	37.2909	140.3527
SCF-00228	[]	3/26/2011 2:30:00 PM	35.51725	140.2781
SCF-00229	Delta 2011-03-26 Chiba []	3/26/2011 2:30:00 PM	35.51725	140.2781
SCF-00233	AMS C-12 Flight []	3/23/2011 2:30:00 AM		
SCF-00233	AMS C-12 Flight []	3/23/2011 2:30:00 AM		
SCF-00234	AMS C-12 Flight []	3/23/2011 2:30:00 AM		
SCF-00235	AMS Helo Filght []	3/24/2011 12:35:00 PM		
SCF-00236	AMS Helo Filght []	3/24/2011 3:47:00 PM		
SCF-00237	CMOC Building 1503 []	3/24/2011 2:13:00 PM	35.74098	139.3609
SCF-00238	CMOC Building 1503 []	3/24/2011 2:16:00 PM	35.74098	139.3609
SCF-00300	USMC Embassy []	3/25/2011 3:30:00 PM	35.66866	139.7433

SCF-00301	USMC Embassy []	3/25/2011 3:30:00 PM	35.66866	139.7433
SCF-00302	USMC Embassy []	3/25/2011 12:46:00 PM	35.66866	139.7433
SCF-00303	USMC Embassy []	3/25/2011 12:46:00 PM	35.66866	139.7433
SCF-00304-A	AMS C-12 Flight []	3/24/2011 11:36:00 AM		
SCF-00304-C	USMC Embassy []	3/26/2011 3:42:00 PM	35.668	139.743
SCF-00305-A	AMS C-12 Flight []	3/24/2011 11:36:00 AM		
SCF-00305-C	USMC Embassy []	3/26/2011 3:42:00 PM	35.668	139.743
SCF-00306	USMC Embassy []	3/26/2011 12:46:00 PM	35.66711	139.7371
SCF-00306	USMC Embassy []	3/26/2011 12:46:00 PM	35.66711	139.7371
SCF-00307-A	AMS C-12 Flight []	3/26/2011 9:35:00 AM		
SCF-00307-C	USMC Embassy []	3/26/2011 12:46:00 PM	35.66711	139.7371
SCF-00308-A	AMS C-12 Flight []	3/26/2011 9:34:00 AM		
SCF-00308-C	USMC Embassy []	3/27/2011 3:43:00 PM	35.66845	139.7432
SCF-00309	USMC Embassy []	3/27/2011 3:43:00 PM	35.66845	139.7432
SCF-00310	USMC Embassy []	3/27/2011 1:00:00 PM	35.66866	139.7433
SCF-00311	USMC Embassy []	3/27/2011 1:00:00 PM	35.66866	139.7433
SCF-00321	Delta 2011-03-24 Expressway	3/24/2011 1:44:00 PM	37.38742	140.3118
SCF-00322	Delta 2011-03-24 Expressway	3/24/2011 1:44:00 PM	37.38742	140.3118
SCF-00324	Delta 2011-03-24 Expressway	3/23/2011 10:40:55 PM	37.50872	140.1559
SCF-00325	Delta 2011-03-24 Expressway	3/24/2011 2:39:00 PM	37.50872	140.1559
SCF-00326	Delta 2011-03-25 Mito []	3/25/2011 4:00:00 PM	36.25553	140.5508
SCF-00327	Delta 2011-03-25 Mito []	3/25/2011 3:57:06 PM	36.25553	140.5508
SCF-00328	Delta 2011-03-25 Mito []	3/25/2011 1:39:28 AM	35.95601	140.589
SCF-00329	Delta 2011-03-25 Mito []	3/25/2011 5:28:00 PM	35.95601	140.589
SCF-00330	Delta 2011-03-26 Chiba []	3/25/2011 7:38:58 PM	35.66226	140.0239
SCF-00331	Delta 2011-03-26 Chiba []	3/26/2011 11:23:00 AM	35.66226	140.0239
SCF-00331CS	Delta 2011-03-26 Chiba []	3/26/2011 11:23:46 AM	35.66226	140.0239
SCF-00332	Delta 2011-03-26 Chiba []	3/26/2011 12:53:00 AM	35.49641	140.4286
SCF-00333	Delta 2011-03-26 Chiba []	3/26/2011 12:53:00 PM	35.49635	140.4286
SCF-00516	Delta 2011-03-20 Expressway	3/20/2011 2:21:41 AM	37.80435	140.4541
SCF-00570	Delta 2011-03-18 []	3/18/2011 2:25:00 PM	38.72	141.5335
SCF-00571	Delta 2011-03-18 []	3/18/2011 12:18:18 AM	38.71987	141.5333
SCF-00572	Delta 2011-03-20 Expressway	3/20/2011 9:03:00 PM		
SCF-03009	USMC Embassy []	3/30/2011 12:15:00 PM	35.667	139.737
SCF-03010	USMC Embassy []	3/30/2011 12:15:00 PM	35.668	139.743
SCF-03011	USMC Embassy []	3/31/2011 4:06:00 AM	35.668	139.743
SCF-03012	USMC Embassy []	3/31/2011 4:06:00 PM	35.668	139.743
SCF-03013	USMC Embassy []	3/30/2011 4:05:00 PM	35.668	139.743
SCF-03014	USMC Embassy []	3/30/2011 4:05:00 PM	35.668	139.743
SCF-03017	USMC Embassy []	4/4/2011 7:13:39 PM	35.668	139.743
SCF-03018	USMC Embassy []	4/1/2011 2:14:00 AM	35.668	139.743
SCF-03019	USMC Embassy []	4/1/2011 12:18:00 PM	35.667	139.737
SCF-03020	USMC Embassy []	4/1/2011 12:18:00 PM	35.667	139.737
SCF-03021	USMC Embassy []	4/4/2011 7:37:15 PM	35.668	139.743
SCF-03022	USMC Embassy []	4/2/2011 12:16:00 PM	35.668	139.743
SCF-03023	USMC Embassy []	4/4/2011 7:51:13 PM	35.667	139.737
SCF-03024	USMC Embassy []	4/4/2011 7:54:29 PM	35.667	139.737
SCF-03025	USMC Embassy []	4/3/2011 12:03:00 AM	35.668	139.743
SCF-03026	USMC Embassy []	4/4/2011 8:23:56 PM	35.668	139.743
SCF-03027	USMC Embassy []	4/2/2011 8:30:00 PM		
SCF-03028	USMC Embassy []	4/2/2011 8:30:00 AM		

SCF-03029	USMC Embassy []	4/4/2011 12:05:00 AM	35.668	139.743
SCF-03030	USMC Embassy []	4/4/2011 12:05:00 AM	35.668	139.743
SCF-03031	USMC Embassy []	4/4/2011 12:40:00 PM	35.667	139.737
SCF-03032	USMC Embassy []	4/4/2011 12:40:00 PM	35.667	139.737
SCF-03035	USMC Embassy []	4/4/2011 8:42:00 PM	35.667	139.737
SCF-07627	Delta 2011-03-21 Expressway	3/20/2011 11:55:23 PM	37.80423	140.4541
SCF-07628	Delta 2011-03-21 Expressway	3/21/2011 4:43:00 PM	37.35413	140.3229
SCF-07634	Delta 2011-03-21 Expressway	3/21/2011 2:17:00 PM	37.83659	140.3818
SCF-07635	Delta 2011-03-21 Expressway	3/21/2011 3:49:00 PM	37.80423	140.4541
SCF-07639	CMOC Building 1503 []	3/16/2011 7:00:00 PM	35.74098	139.3609
SCF-07640	CMOC Building 1503 []	3/17/2011 7:35:00 AM	35.74098	139.3609
SCF-07641	Alpha 2011-03-16 Embassy []	3/16/2011 1:55:00 PM	35.66852	139.7434
SCF-07642	Delta 2011-04-01 Yokosuko []	3/31/2011 7:36:06 PM	35.29196	139.674
SCF-07668	Alpha 2011-03-19 H60 Helo Te	3/19/2011 4:33:00 PM	37.22255	140.43
SCF-07670	Alpha 2011-03-19 H60 Helo Te	3/19/2011 4:24:00 PM	37.22255	140.43
SCF-07671	Alpha 2011-03-19 H60 Helo Te	3/19/2011 3:07:00 PM	37.1485	140.9994
SCF-07672	Alpha 2011-03-19 H60 Helo Te	3/19/2011 1:17:00 PM	37.1485	140.9994
SCF-07700	Delta 2011-03-21 Expressway	3/21/2011 2:15:00 PM	37.83659	140.3818
SCF-08201	AMS C-12 Flight []	3/25/2011 12:49:00 PM		
SCF-08202	AMS C-12 Flight []	3/25/2011 12:49:00 PM		
SCF-08203	AMS Helo Filght []	3/26/2011 3:40:00 PM		
SCF-08205	CMOC Building 1503 []	3/25/2011 7:35:00 AM	35.74098	139.3609
SCF-08206	CMOC Building 1503 []	3/25/2011 3:35:00 AM	35.74098	139.3609
SCF-08207	CMOC Building 1503 []	3/25/2011 7:20:00 PM	35.74098	139.3609
SCF-08208	CMOC Building 1503 []	3/25/2011 7:20:00 PM	35.74094	139.3609
SCF-08209	[]	3/25/2011 3:36:00 PM	35.74098	139.3609
SCF-08210	AMS Helo Filght []	3/27/2011 9:33:00 PM		
SCF-08211	Alpha 2011-03-27 Joban EX []	3/27/2011 12:37:19 PM	36.9993	140.822
SCF-08212	Alpha 2011-03-27 Joban EX []	3/27/2011 2:47:00 PM	36.64819	140.6741
SCF-08213	Alpha 2011-03-27 Joban EX []	3/27/2011 2:47:00 PM	36.64819	140.6741
SCF-08214	Alpha 2011-03-27 Joban EX []	3/27/2011 2:03:00 PM	36.79806	140.7282
SCF-08215	Alpha 2011-03-27 Joban EX []	3/27/2011 2:03:00 PM	36.79806	140.7282
SCF-08216	Delta 2011-04-01 Yokosuko []	3/31/2011 7:32:59 PM	35.29196	139.674
SCF-08221	Alpha 2011-03-27 Joban EX []	3/27/2011 9:09:00 PM	36.9993	140.822
SCF-08222	AMS Helo Filght []	3/29/2011 3:40:00 AM		
SCF-08223	AMS Helo Filght []	3/29/2011 3:40:00 PM		
SCF-08224	Alpha 2011-03-31 Kumagaya L	3/30/2011 7:19:54 PM	36.16333	139.3618
SCF-08226	AMS Helo Filght []	3/28/2011 1:33:00 PM		
SCF-08227	[]	3/25/2011 3:36:00 PM	35.74098	139.3609
SCF-08228	CMOC Building 1503 []	3/25/2011 7:21:00 PM	35.791	139.361
SCF-08229	CMOC Building 1503 []	3/26/2011 7:21:00 PM	35.791	139.361
SCF-08245	Alpha 2011-03-26 Yokosuka N	3/25/2011 10:19:55 PM	35.29338	139.672
SCF-08246	Delta 2011-03-28 Yokusko EX	3/29/2011 1:20:00 PM	35.29337	139.672
SCF-08248	Delta 2011-03-28 Yokusko EX	3/28/2011 1:30:00 PM	35.29337	139.672
SCF-08258	Alpha 2011-03-26 Yokosuka N	3/26/2011 2:22:00 PM	35.2933	139.9719
SCF-08259	Delta 2011-03-28 Yokusko EX	3/28/2011 1:20:00 AM	35.29337	139.672
SCF-08259-D1	Delta 2011-03-28 Yokusko EX	3/27/2011 9:37:48 PM	35.29337	139.672
SCF-08260	Alpha 2011-03-26 Yokosuka N	3/26/2011 4:25:00 PM	35.45629	193.4349
SCF-08261	Alpha 2011-03-26 Yokosuka N	3/26/2011 1:53:05 AM	35.49502	139.3953
SCF-08262	Alpha 2011-03-26 Yokosuka N	3/26/2011 5:55:00 PM	35.495	139.3953
SCF-08263	CMOC Building 1503 []	4/6/2011 6:45:51 PM	35.74102	139.3609

SCF-08265	Alpha 2011-03-26 Yokosuka N	3/26/2011 12:29:36 AM	35.45629	139.4349
SCF-08266	AMS Helo Flight []	3/26/2011 3:40:00 PM		
SCF-08267	AMS Helo Flight []	3/27/2011 2:29:00 PM		
SCF-08268	AMS Helo Flight []	3/27/2011 2:29:00 PM		
SCF-08269	CMOC Building 1503 []	3/26/2011 11:58:06 PM	35.74102	139.3609
SCF-0827	CMOC Building 1503 []	3/25/2011 3:29:18 AM	35.74094	139.3609
SCF-08270	CMOC Building 1503 []	3/27/2011 12:00:54 AM	35.74102	139.3609
SCF-08271	AMS Helo Flight []	3/27/2011 4:30:00 PM		
SCF-08272	AMS Helo Flight []	3/27/2011 4:30:00 PM		
SCF-08273	AMS C-12 Flight []	3/27/2011 1:48:00 PM		
SCF-08274	AMS C-12 Flight []	3/27/2011 1:48:00 PM		
SCF-08275	Delta 2011-03-27 Tohoku EX []	3/26/2011 11:28:19 PM	36.8586	140.1167
SCF-08276	Delta 2011-03-28 Yokusko EX	3/28/2011 3:35:00 AM	35.4347	139.4567
SCF-08276-D1	Delta 2011-03-28 Yokusko EX	3/27/2011 11:44:51 PM	35.45672	139.4347
SCF-08277	Delta 2011-03-28 Yokusko EX	3/28/2011 5:02:00 AM	35.495	139.3953
SCF-08277-D1	Delta 2011-03-28 Yokusko EX	3/28/2011 1:02:48 AM	35.49495	139.3953
SCF-08278	Delta 2011-03-28 Yokusko EX	3/28/2011 1:02:00 AM	35.95	
SCF-08278-D1	Delta 2011-03-28 Yokusko EX	3/28/2011 1:02:48 AM	35.49495	139.3953
SCF-08285	Delta 2011-03-27 Tohoku EX []	3/26/2011 10:43:22 PM	36.94839	140.104
SCF-08286	Delta 2011-03-27 Tohoku EX []	3/26/2011 10:45:25 PM	36.94839	140.104
SCF-08287	Delta 2011-03-27 Tohoku EX []	3/26/2011 11:26:10 PM	36.8586	140.1167
SCF-08288	AMS C-12 Flight []	3/28/2011 8:18:00 AM		
SCF-08289	AMS C-12 Flight []	3/28/2011 1:20:48 AM		
SCF-08290	CMOC Building 1503 []	3/27/2011 10:00:00 PM	35.74098	139.3609
SCF-08291	CMOC Building 1503 []	3/27/2011 10:00:00 PM	35.74098	139.3609
SCF-08292	AMS C-12 Flight []	4/1/2011 2:30:00 AM		
SCF-08293	AMS C-12 Flight []	4/1/2011 2:30:00 PM		
SCF-08294	CMOC Building 1503 []	3/28/2011 10:00:00 AM	35.74098	139.3609
SCF-08295	CMOC Building 1503 []	3/28/2011 10:00:00 AM	35.74098	139.3609
SCF-08296	AMS Helo Flight []	3/28/2011 2:03:00 PM		
SCF-08297	AMS Helo Flight []	3/29/2011 1:40:00 PM		
SCF-08298	AMS C-12 Flight []	3/29/2011 2:01:00 PM		
SCF-08299	AMS C-12 Flight []	3/29/2011 2:01:00 PM		
SCF-08601	AMS Helo Flight []	3/28/2011 2:03:00 PM		
SCF-08602	AMS Helo Flight []	3/29/2011 1:40:00 AM		
SCF-08604	Alpha 2011-03-31 Kumagaya L	3/30/2011 7:16:58 PM	36.16333	139.3618
SCF-08605	Delta 2011-03-29 Tohoka EX -	3/28/2011 10:14:31 PM	36.7367	139.5173
SCF-08606	Delta 2011-03-29 Tohoka EX -	3/29/2011 5:03:00 PM	36.34385	139.2874
SCF-08607	Delta 2011-03-29 Tohoka EX -	3/29/2011 5:03:00 PM	36.34385	139.2874
SCF-08617	Delta 2011-03-29 Tohoka EX -	3/28/2011 8:07:37 PM	36.72594	139.7877
SCF-08618	Delta 2011-03-29 Tohoka EX -	3/29/2011 12:01:00 PM	36.72594	139.7877
SCF-08619	Delta 2011-03-29 Tohoka EX -	3/29/2011 1:53:00 PM	36.7367	139.5173
SCF-08620	CMOC Building 1503 []	3/29/2011 6:17:52 PM	35.74104	139.361
SCF-08622	CMOC Building 1503 []	3/29/2011 6:14:27 PM	35.74104	139.361
SCF-08623	AMS C-12 Flight []	3/30/2011 9:13:00 AM		
SCF-08624	AMS C-12 Flight []	3/30/2011 9:13:00 AM		
SCF-08625	AMS Helo Flight []	3/30/2011 3:30:00 PM		
SCF-08626	AMS Helo Flight []	3/30/2011 3:30:00 PM		
SCF-08627	AMS Helo Flight []	3/30/2011 2:30:00 PM		
SCF-08628	AMS Helo Flight []	3/30/2011 2:30:00 PM		
SCF-08630	Delta 2011-04-03 Yokuska []	4/3/2011 11:30:00 AM	35.2934	139.672

SCF-08631 C	CMOC Building 1503 []	4/1/2011 10:05:00 AM	35.74105	139.361
SCF-08632	CMOC Building 1503 []	4/1/2011 10:05:00 PM	35.74105	139.361
SCF-08633	AMS Helo Filght []	3/31/2011 7:50:00 PM		
SCF-08634	AMS Helo Filght []	4/1/2011 11:50:00 AM		
SCF-08635	AMS Helo Filght []	3/31/2011 10:30:00 PM		
SCF-08637	Alpha 2011-04-01 Coast []	4/1/2011 12:40:00 PM	35.76015	140.7983
SCF-08638	Alpha 2011-04-01 Coast []	4/1/2011 12:40:00 PM	35.76015	140.7983
SCF-08639	AMS Helo Filght []	4/2/2011 2:12:00 PM		
SCF-08641	Delta 2011-04-03 Yokuska []	4/3/2011 11:30:00 AM	35.2934	139.672
SCF-08642	CMOC Building 1503 []	4/2/2011 10:00:00 AM	35.741	139.3609
SCF-08643	CMOC Building 1503 []	4/2/2011 10:00:00 AM	35.741	139.3609
SCF-08644	Alpha 2011-04-01 Hwy 118 []	4/2/2011 12:42:00 PM	37.28212	140.2546
SCF-08645	Delta 2011-03-30 Yokusko EX	3/30/2011 11:05:00 AM	35.2934	139.672
SCF-08646	Delta 2011-03-30 Yokusko EX	3/29/2011 7:12:07 PM	35.2934	139.672
SCF-08647	Delta 2011-03-28 Yokusko EX	3/28/2011 3:35:00 PM	35.4347	139.4567
SCF-08647-D1	Delta 2011-03-28 Yokusko EX	3/27/2011 11:46:58 PM	35.45672	139.4347
SCF-08661	CMOC Building 1503 []	4/6/2011 6:50:19 PM	35.74102	139.3609
SCF-08662	AMS Helo Filght []	4/2/2011 3:00:00 PM		
SCF-08663	AMS Helo Filght []	4/2/2011 11:38:00 AM		
SCF-08664	AMS C-12 Flight []	4/2/2011 1:30:00 PM		
SCF-08665	AMS C-12 Flight []	4/2/2011 1:30:00 PM		
SCF-08666	Alpha 2011-04-01 Hwy 118 []	4/2/2011 12:40:00 PM	37.28212	140.2546
SCF-08667	AMS Helo Filght []	4/1/2011 2:30:00 PM		
SCF-08668	AMS Helo Filght []	4/3/2011 12:37:18 PM		
SCF-08669	AMS Helo Filght []	4/3/2011 12:37:00 PM		
SCF-08670	AMS Helo Filght []	4/4/2011 5:10:00 PM		
SCF-08671	AMS Helo Filght []	4/4/2011 5:10:00 PM		
SCF-08672	AMS C-12 Flight []	4/3/2011 2:37:00 PM		
SCF-08673	AMS C-12 Flight []	4/3/2011 2:37:00 PM		
SCF-08674	Delta 2011-04-04 Fuji []	4/4/2011 11:55:00 AM	35.31933	138.8685
SCF-08675	Delta 2011-04-04 Fuji []	4/4/2011 11:55:00 AM	35.31933	138.8685
SCF-08678	Alpha 2011-04-03 Zama, Atsug	4/3/2011 10:00:00 AM	35.45499	139.4307
SCF-08679	Alpha 2011-04-03 Zama, Atsug	4/3/2011 10:00:00 AM	35.45499	139.4307
SCF-08680	Alpha 2011-04-03 Zama, Atsug	4/3/2011 4:42:00 PM	35.49502	139.3954
SCF-08681	CMOC Building 1503 []	4/4/2011 10:23:00 AM	35.74102	139.3609
SCF-08682	CMOC Building 1503 []	4/4/2011 10:23:00 AM	35.74102	139.3609
SCF-08683	AMS Helo Filght []	4/4/2011 3:37:00 PM		
SCF-08684	AMS Helo Filght []	4/4/2011 3:37:00 PM		
SCF-08687	Alpha 2011-04-05 Yokuska []	4/4/2011 6:57:00 PM	35.29336	139.672
SCF-08688	Alpha 2011-04-05 Yokuska []	4/4/2011 7:01:13 PM	35.29336	139.672
SCF-08689	Alpha 2011-04-03 Zama, Atsug	4/3/2011 4:42:00 PM	35.49502	139.3954
SCF-08690	CMOC Building 1503 []	4/4/2011 6:09:00 AM	35.741	139.3699
SCF-08690-D1	CMOC Building 1503 []	4/4/2011 6:26:35 PM	35.74104	139.361
SCF-08691	CMOC Building 1503 []	4/4/2011 6:28:46 PM	35.74104	139.361
SCF-08694	AMS Helo Filght []	4/4/2011 10:31:00 PM		
SCF-08695	AMS Helo Filght []	4/4/2011 10:31:00 PM		
SCF-08698	CMOC Building 1503 []	4/5/2011 6:02:00 PM	35.741	139.361
SCF-08699	CMOC Building 1503 []	4/5/2011 6:02:00 PM	35.741	139.361
SCF-08701	CMOC Building 1503 []	4/3/2011 10:00:00 AM	35.74099	139.3609
SCF-08702	CMOC Building 1503 []	4/3/2011 10:00:00 AM	35.74099	139.3609
SCF-08703	AMS Helo Filght []	4/2/2011 2:12:00 PM		

SCF-08901	Delta 2011-03-18 []	3/17/2011 10:46:31 PM	38.69179	141.1357
SCF-08902	Delta 2011-03-18 []	3/18/2011 12:10:11 AM	38.72002	141.5335
SCF-08903	Delta 2011-03-31 Mito []	3/30/2011 11:11:05 PM	36.29246	140.5594
SCF-08904	Delta 2011-03-31 Mito []	3/30/2011 11:13:41 PM	36.29246	140.5594
SCF-08905	Delta 2011-03-31 Mito []	3/31/2011 12:41:57 AM	35.99638	140.6436
SCF-08906	Delta 2011-03-31 Mito []	3/31/2011 12:43:58 AM	35.99638	140.6436
SCF-08923	Alpha 2011-03-31 Kumagaya L	3/30/2011 9:52:57 PM	36.38374	139.0896
SCF-08924	Alpha 2011-03-31 Kumagaya L	3/30/2011 9:56:12 PM	36.38374	139.0896
SCF-08925	Alpha 2011-04-01 Coast []	4/1/2011 3:56:00 PM	36.46025	140.5969
SCF-08985	CMOC Building 1503 []	3/17/2011 7:35:00 AM	35.74106	139.3609
SCF-08986	Alpha 2011-03-16 Embassy []	3/16/2011 7:38:00 PM	35.66852	139.7434
SCF-08987	Bravo 2011-03-18 Embassy []	3/17/2011 9:59:32 PM	35.66871	139.7433
SCF-08988	Bravo 2011-03-18 Embassy []	3/17/2011 10:09:28 PM	35.66871	139.7433
SCF-08989	Bravo 2011-03-18 Embassy []	3/17/2011 10:55:55 PM	35.66715	139.7371
SCF-08990	Bravo 2011-03-18 Embassy []	3/17/2011 11:03:18 PM	35.66715	139.7371
SCF-08991	Delta 2011-03-20 Expressway	3/20/2011 5:49:00 PM	37.80419	140.4541
SCF-08993	Bravo 2011-03-18 Embassy []	3/17/2011 10:59:36 PM	35.66715	139.7371
SCF-08994	Bravo 2011-03-17 Embassy []	3/18/2011 1:58:00 PM	35.66871	139.7433
SCF-08995	Alpha 2011-03-17 US Aid []	3/17/2011 11:38:00 AM	36.66852	139.7434
SCF-08996	Alpha 2011-03-17 US Aid []	3/16/2011 8:55:29 PM	36.3371	140.5835
SCF-08997	Alpha 2011-03-17 US Aid []	3/16/2011 10:50:19 PM	36.52406	140.227
SCF-08998	Alpha 2011-03-17 US Aid []	3/17/2011 12:45:00 PM	36.3371	140.5835
SCF-08999	Alpha 2011-03-17 US Aid []	3/17/2011 2:50:00 PM		
SCF-09000	Alpha 2011-04-01 Coast []	4/1/2011 3:56:00 PM	36.46025	140.5969
SCF-8633	AMS Helo Filght []	4/3/2011 11:50:00 AM		

Filter Size	Filter Unit	Date Time On	Date Time Off	Start Flow	Stop Flow	Total Volume
2		3/21/2011 3:45:00 PM	3/21/2011 7:10:00 PM	1.1	1.09	808110
2		3/21/2011 4:34:00 PM	3/21/2011 4:54:00 PM	0	0	22
2		3/22/2011 2:43:40 PM	3/22/2011 3:03:39 PM	0	0	25.8
2		3/22/2011 11:53:00 PM	3/22/2011 12:14:00 PM	0	0	23.44
		3/22/2011 11:53:00 AM	3/22/2011 12:14:00 PM			23.44
2		3/22/2011 1:40:00 PM	3/22/2011 2:00:00 PM	0	0	21.49
2		3/22/2011 1:40:07 PM	3/22/2011 2:00:07 PM	0	0	21.49
2		3/22/2011 2:34:00 PM	3/22/2011 2:54:00 PM	0	0	22.04
2		3/17/2011 7:35:00 AM	3/18/2011 9:41:00 AM			1817
2		3/18/2011 9:42:00 AM	3/19/2011 8:40:00 AM			1580.1
2		3/18/2011 9:42:00 AM	3/19/2011 8:40:00 AM			1580.1
4		3/18/2011 2:00:00 PM	3/19/2011 12:50:00 PM	0	0	1048
		3/23/2011 9:16:54 PM	3/23/2011 9:16:54 PM			
4		3/18/2011 2:15:40 PM	3/19/2011 12:58:40 PM			13630
2		3/18/2011 2:00:00 PM	3/19/2011 12:50:00 PM			1048
2		3/23/2011 3:34:46 AM	3/23/2011 3:54:46 AM	0	0	20.3
2		3/18/2011 3:00:26 PM	3/19/2011 1:50:26 PM	0	0	1467.8
4		3/18/2011 3:10:17 PM	3/19/2011 2:00:17 PM	0	0	15751.74
2		3/18/2011 3:00:45 PM	3/19/2011 1:50:45 PM	0	0	1467.8
2		3/19/2011 8:45:00 AM	3/20/2011 8:45:00 AM			1613.2
2		3/19/2011 8:45:00 AM	3/20/2011 8:45:00 AM			1613.21
2		3/19/2011 12:55:29 PM	3/20/2011 11:35:29 AM	0	0	1041.4
2		3/19/2011 12:55:54 PM	3/20/2011 11:35:54 AM	0	0	1041.4
4		3/19/2011 1:05:42 PM	3/20/2011 12:05:00 PM	0	0	13110
2		3/19/2011 1:55:24 PM	3/20/2011 1:00:24 PM	0	0	1461.4
2		3/19/2011 1:55:28 PM	3/20/2011 1:00:28 PM	0	0	1461.4
4		3/19/2011 2:05:07 PM	3/20/2011 1:10:07 PM	0	0	16503
		3/19/2011 2:02:00 PM	3/19/2011 2:12:00 PM			11
2		3/20/2011 11:40:35 AM	3/21/2011 12:45:34 PM	0	0	1123.11
2		3/20/2011 11:40:00 AM	3/21/2011 12:45:00 PM			1123
2		3/21/2011 1:30:32 PM	3/22/2011 2:10:32 PM	0	0	1593.4
2		3/20/2011 1:05:00 PM	3/21/2011 1:25:00 PM			1516
2		3/20/2011 1:05:00 PM	3/21/2011 1:25:00 PM			1516
2		3/21/2011 1:30:01 PM	3/22/2011 2:10:01 AM	0	0	1593.4
2		3/21/2011 12:45:43 PM	3/21/2011 4:25:43 PM	0	0	164.5
2		3/16/2011 12:54:00 PM	3/16/2011 1:55:00 PM			46
2		3/20/2011 1:02:00 PM	3/20/2011 2:35:00 PM			103.47
2		3/20/2011 1:02:00 PM	3/20/2011 2:35:00 PM			103.47
2		3/20/2011 12:02:00 PM	3/20/2011 2:20:00 PM			150
		3/20/2011 12:02:00 PM	3/20/2011 2:20:00 PM			150
2		3/16/2011 4:58:00 PM	3/16/2011 7:00:00 PM			146
2		3/20/2011 8:55:00 AM	3/21/2011 7:30:00 AM			1502.11
2		3/20/2011 8:55:00 AM	3/21/2011 7:30:00 AM			1502.11
2		3/16/2011 7:00:00 PM	3/17/2011 7:35:00 AM			890
		3/19/2011 2:49:00 PM	3/19/2011 2:59:00 PM			12
2		3/22/2011 11:54:00 PM	3/22/2011 12:14:00 AM	0	0	
		3/19/2011 2:49:00 PM	3/19/2011 2:59:00 PM			12
		3/19/2011 4:14:00 PM	3/19/2011 4:24:00 PM			22.9
2		3/21/2011 12:45:00 PM	3/21/2011 4:25:00 PM			164.5

2	3/21/2011 4:25:54 PM	3/22/2011 12:55:00 PM	0	0	970
2	3/21/2011 4:25:11 PM	3/22/2011 12:55:11 PM	0	0	970
2	3/23/2011 2:00:42 PM	3/24/2011 5:37:42 PM	0	0	1771.5
2	3/23/2011 2:00:02 PM	3/24/2011 5:37:02 PM			1771.5
2	3/20/2011 5:20:00 PM	3/20/2011 5:48:00 PM			33
	3/20/2011 5:20:00 PM	3/20/2011 5:48:00 PM			33
2	3/20/2011 6:26:00 PM	3/20/2011 6:46:00 AM			23
2	3/20/2011 6:26:00 PM	3/20/2011 6:46:00 PM			23
	3/22/2011 2:43:00 PM	3/22/2011 3:03:00 PM			25.8
2	3/22/2011 3:17:02 PM	3/22/2011 11:37:02 PM	0	0	22.5
	3/22/2011 3:17:00 PM	3/22/2011 3:37:00 PM			22.5
2	3/22/2011 3:54:00 AM	3/22/2011 4:14:00 AM	0	0	21.3
	3/22/2011 3:54:00 PM	3/22/2011 4:14:00 PM			21.3
2	3/22/2011 5:18:50 PM	3/22/2011 5:38:50 PM	0	0	21.1
	3/22/2011 5:18:00 PM	3/22/2011 5:38:00 PM			21.1
2	3/22/2011 4:26:56 PM	3/22/2011 4:46:56 PM	0	0	21.1
	3/22/2011 4:26:00 PM	3/22/2011 4:46:00 PM			21.1
2	3/22/2011 5:57:17 AM	3/22/2011 6:17:17 AM	0	0	20.8
	3/22/2011 5:57:00 PM	3/22/2011 6:17:00 PM			20.8
	3/22/2011 2:40:00 PM	3/22/2011 6:20:00 AM			15.41
2	3/21/2011 7:30:00 AM	3/21/2011 1:42:00 PM			416.64
2	3/21/2011 7:30:05 AM	3/21/2011 1:42:05 AM	0	0	416.64
	3/22/2011 4:09:00 PM	3/22/2011 5:39:00 PM			86.8
	3/22/2011 4:09:00 PM	3/22/2011 5:39:00 PM			86.8
2	3/22/2011 2:34:00 PM	3/22/2011 2:54:00 PM	0	0	22.04
2	3/22/2011 3:38:00 PM	3/22/2011 3:58:00 PM	0	0	22.04
2	3/22/2011 3:38:00 PM	3/22/2011 3:58:00 PM	0	0	22.04
2	3/22/2011 4:22:00 PM	3/22/2011 4:42:00 PM	0	0	22.02
2	3/22/2011 4:22:00 PM	3/22/2011 4:42:00 PM	0	0	22.02
2	4/3/2011 2:51:00 PM	4/3/2011 4:42:00 PM	0	0	
2	3/21/2011 1:07:32 AM	3/21/2011 1:27:31 AM	0	0	24.7
2	3/21/2011 1:07:00 PM	3/21/2011 1:27:00 PM			24.7
2	3/21/2011 1:41:42 AM	3/21/2011 2:01:42 AM	0	0	23.2
2	3/21/2011 1:41:00 PM	3/21/2011 2:01:00 PM			23.2
2	3/21/2011 2:12:24 AM	3/21/2011 2:32:24 PM	0	0	24.3
2	3/21/2011 2:12:00 PM	3/21/2011 2:32:00 PM			24.3
2	3/21/2011 2:43:51 AM	3/21/2011 3:03:51 AM	0	0	24.9
2	3/21/2011 2:43:00 PM	3/21/2011 3:03:00 PM			24.9
2	3/21/2011 3:17:31 AM	3/21/2011 3:37:31 AM	0	0	24.1
2	3/21/2011 3:17:00 PM	3/21/2011 3:37:00 PM			24.1
2	3/21/2011 1:42:00 PM	3/21/2011 2:45:00 PM			7.56
2	3/21/2011 1:42:00 PM	3/21/2011 2:45:00 PM			69
2	3/21/2011 2:45:00 PM	3/21/2011 3:45:00 PM			67
2	3/21/2011 2:45:00 PM	3/21/2011 1:31:33 AM			67
2	3/21/2011 2:45:00 PM	3/21/2011 3:45:00 AM			67
2	3/21/2011 3:45:00 PM	3/21/2011 7:10:00 PM			220
2	3/21/2011 3:45:00 PM	3/21/2011 7:10:00 PM			220
2	3/21/2011 12:00:00 PM	3/21/2011 3:40:00 PM			15.5
2	3/21/2011 7:10:00 PM	3/21/2011 11:00:00 PM			252
2	3/21/2011 7:10:00 AM	3/21/2011 11:00:00 AM			252
	3/21/2011 11:00:00 PM	3/22/2011 3:00:00 AM			268

2		3/21/2011 11:00:00 PM	3/22/2011 3:00:00 AM			268
2		3/22/2011 3:00:57 AM	3/22/2011 7:00:57 AM	0	0	268.5
2		3/22/2011 3:00:29 AM	3/22/2011 7:00:29 PM			268.5
		3/22/2011 7:00:00 AM	3/22/2011 11:00:00 AM			268.2
		3/22/2011 7:00:00 AM	3/22/2011 11:00:00 AM			268.2
2		3/22/2011 12:55:44 PM	3/23/2011 1:00:43 PM			1127.6
2		3/22/2011 12:55:09 PM	3/23/2011 1:00:09 PM			1127.6
2		3/22/2011 2:10:40 PM	3/23/2011 2:00:40 PM	0	0	1512.07
2		3/22/2011 2:10:55 PM	3/23/2011 2:00:55 AM	0	0	1512.07
2		3/23/2011 1:00:47 PM	3/24/2011 3:52:46 PM			1287.5
2		3/23/2011 1:00:20 PM	3/24/2011 3:52:20 PM			1287.5
		3/22/2011 11:00:00 AM	3/22/2011 3:12:00 PM			281.3
		3/22/2011 11:00:00 AM	3/22/2011 3:12:00 PM			281.3
		3/22/2011 3:12:00 PM	3/22/2011 7:09:00 PM			267
		3/22/2011 3:12:00 PM	3/22/2011 7:09:00 PM			267
						809.8
						809.8
2		3/23/2011 7:10:00 AM	3/23/2011 12:08:00 PM			817
						817
2		3/23/2011 2:43:00 PM	3/23/2011 3:03:00 PM	0	0	22.95
2		3/23/2011 2:43:00 PM	3/23/2011 3:03:00 PM	0	0	22.95
2		3/23/2011 3:43:00 PM	3/23/2011 4:03:00 PM	0	0	23
2		3/23/2011 3:43:00 PM	3/23/2011 4:03:00 PM	0	0	23
2		3/23/2011 1:32:11 PM	3/23/2011 1:52:09 PM	0	0	21.1
2		3/23/2011 1:32:14 PM	3/23/2011 1:52:14 AM	0	0	21.1
2		3/23/2011 2:09:33 PM	3/23/2011 2:29:33 PM	0	0	20.6
2		3/23/2011 2:09:39 PM	3/23/2011 2:29:39 PM	0	0	20.6
2		3/23/2011 3:34:00 PM	3/23/2011 3:54:00 PM			20.3
2		3/23/2011 3:34:00 PM	3/23/2011 3:54:00 PM	0	0	20.3
2		3/24/2011 1:41:12 AM	3/24/2011 2:01:11 AM	0	0	22.5
2		3/24/2011 1:41:38 AM	3/24/2011 2:01:00 PM	0	0	22.5
2		3/19/2011 2:02:00 PM	3/19/2011 2:12:00 PM	0	0	
2		3/23/2011 11:10:00 AM	3/23/2011 3:31:00 PM			158.71
2		3/23/2011 11:10:00 AM	3/23/2011 3:31:00 PM			158.71
2		3/23/2011 8:32:00 AM	3/23/2011 12:45:00 PM			293.5
		3/29/2011 5:12:58 AM	3/29/2011 5:12:58 AM			
2		3/23/2011 8:32:00 AM	3/23/2011 12:45:00 PM			293.5
2		3/24/2011 2:42:09 AM	3/24/2011 3:02:09 AM	0	0	21.6
2		3/24/2011 2:42:18 PM	3/24/2011 3:02:18 PM	0	0	21.6
2		3/24/2011 3:30:42 PM	3/24/2011 3:50:42 PM	0	0	20.12
2		3/24/2011 3:30:29 PM	3/24/2011 3:50:29 PM	0	0	20.12
		3/26/2011 2:10:00 PM	3/26/2011 2:30:00 PM			20.7
2		3/26/2011 2:10:31 PM	3/26/2011 2:30:31 PM			20.7
2		3/23/2011 2:30:00 PM	3/23/2011 2:30:00 PM			261.6
		3/29/2011 5:19:10 AM	3/29/2011 5:19:10 AM			
2		3/23/2011 2:30:00 PM	3/23/2011 6:08:00 PM			261.6
2		3/24/2011 12:35:00 PM	3/24/2011 3:47:00 AM			208
2		3/24/2011 12:35:00 PM	3/24/2011 3:47:00 PM			208
						830.3
						830.3
2		3/24/2011 3:53:00 PM	3/25/2011 3:24:00 PM			1113.08

2		3/24/2011 3:53:00 PM	3/25/2011 3:30:00 AM			1113.08
2		3/24/2011 5:38:00 PM	3/25/2011 12:45:00 PM			1202.96
2		3/24/2011 5:38:00 PM	3/25/2011 12:45:00 PM			1202.96
2		3/24/2011 11:36:00 AM	3/24/2011 4:09:00 PM			287
		3/25/2011 3:29:00 PM	3/26/2011 3:42:00 PM			1135.59
2		3/24/2011 11:36:00 AM	3/24/2011 4:09:00 PM			287
		3/25/2011 3:29:00 PM	3/26/2011 3:42:00 PM			1135.59
2		3/25/2011 12:46:00 PM	3/26/2011 12:46:00 PM			1484.76
		3/29/2011 4:26:20 AM	3/29/2011 4:26:20 AM			
2		3/26/2011 9:35:00 AM	3/26/2011 12:36:00 PM			188.2
2		3/25/2011 12:46:00 PM	3/26/2011 12:46:00 PM			1484.76
2		3/26/2011 9:35:00 AM	3/26/2011 12:36:00 PM			188.2
2		3/26/2011 3:48:43 PM	3/27/2011 3:43:43 AM			1192.11
2		3/26/2011 3:48:36 PM	3/27/2011 3:43:35 PM			1192.11
2		3/26/2011 12:52:00 PM	3/27/2011 1:00:00 PM			1495.6
2		3/26/2011 12:52:00 PM	3/27/2011 1:00:00 PM			1495.6
2		3/24/2011 1:24:22 PM	3/24/2011 1:44:22 AM	0	0	23.56
2		3/24/2011 1:24:51 PM	3/24/2011 1:44:51 PM	0	0	23.56
2		3/24/2011 2:19:23 PM	3/24/2011 2:39:23 AM	0	0	22.77
2		3/24/2011 2:19:55 PM	3/24/2011 2:39:55 AM			22.77
2		3/25/2011 3:37:00 PM	3/25/2011 3:57:09 PM			24.9
2		3/25/2011 3:37:00 PM	3/25/2011 3:57:00 PM			24.9
2		3/25/2011 5:08:00 PM	3/25/2011 5:28:00 PM			23.6
2		3/25/2011 5:08:00 PM	3/25/2011 5:28:00 PM			23.6
2		3/26/2011 11:03:10 AM	3/26/2011 11:23:10 AM			20.03
		3/26/2011 11:03:00 AM	3/26/2011 11:23:00 AM			32.7
		3/26/2011 11:02:22 AM	3/26/2011 11:23:22 AM			32.7
2		3/26/2011 12:33:00 AM	3/26/2011 12:53:00 AM			20.9
		4/1/2011 1:10:31 PM	4/1/2011 1:10:31 PM			20.97
2		3/20/2011 5:29:00 PM	3/20/2011 5:49:00 PM	0	0	21.77
2		3/18/2011 2:25:00 PM	3/18/2011 2:55:00 PM			38.7
2		3/18/2011 3:45:00 PM	3/18/2011 12:15:00 AM			36
1		3/20/2011 4:00:00 PM	3/20/2011 9:03:00 PM			21.4
2		3/29/2011 1:30:00 PM	3/31/2011 12:15:00 PM			2870
2		3/29/2011 1:30:00 AM	3/31/2011 12:15:00 PM			2870
2		3/30/2011 4:06:00 AM	3/31/2011 4:06:00 AM			1119
2		3/30/2011 4:06:00 PM	3/31/2011 4:06:00 PM			1119
2		4/1/2011 6:10:42 PM	4/1/2011 6:10:42 PM			1106.4
2		3/29/2011 4:05:00 PM	3/30/2011 4:05:00 PM			1206.4
2		3/31/2011 4:10:00 AM	4/1/2011 2:14:00 AM			1219
2		3/31/2011 12:10:00 AM	4/1/2011 2:14:00 AM			1219
2		3/31/2011 12:18:00 PM	4/1/2011 12:18:00 PM			1482
2		3/31/2011 12:18:00 PM	4/1/2011 12:18:00 PM			1482
2		4/1/2011 2:15:00 AM	4/2/2011 12:16:00 AM			1007.07
2		4/1/2011 2:15:00 AM	4/2/2011 12:16:00 AM			1007.07
2		3/31/2011 8:20:00 PM	4/1/2011 8:45:00 PM			1245
2		3/31/2011 8:20:00 PM	4/1/2011 8:45:00 PM			1481
2		4/2/2011 12:22:00 AM	4/3/2011 12:03:00 AM			1118.61
2		4/2/2011 12:22:00 AM	4/3/2011 12:03:00 AM			1118.61
2		4/1/2011 8:47:00 PM	4/3/2011 8:30:00 PM			1438.67
2		4/1/2011 8:47:00 PM	4/2/2011 8:30:00 PM			1438.67

2		4/3/2011 12:05:00 AM	4/4/2011 12:05:00 AM			1131.53
2		4/3/2011 12:05:00 AM	4/4/2011 12:05:00 AM			1131.53
2		4/3/2011 12:31:00 PM	4/4/2011 12:40:00 PM			1465.58
2		4/3/2011 12:31:00 PM	4/4/2011 12:40:00 PM			1465.58
2		4/3/2011 8:42:00 PM	4/4/2011 8:42:00 PM			1426.1
2		3/21/2011 3:29:37 AM	3/21/2011 3:49:37 AM	0	0	0
2		3/21/2011 4:34:00 PM	3/21/2011 4:45:00 PM	0	0	22
2		3/21/2011 2:17:00 PM	3/21/2011 2:37:00 PM			22.02
2		3/21/2011 3:29:23 AM	3/21/2011 3:49:23 AM	0	0	21.87
2		3/16/2011 4:58:00 PM	3/16/2011 7:00:00 PM			146
2		3/16/2011 7:00:00 PM	3/17/2011 7:35:00 PM			890
		3/16/2011 12:54:00 PM	3/16/2011 1:55:00 PM			46
2		3/30/2011 11:05:00 AM	4/1/2011 11:27:00 AM	0	0	3134
		3/19/2011 2:02:00 PM	3/19/2011 2:12:00 PM			11
		3/19/2011 4:14:00 PM	3/19/2011 4:24:00 PM			22.9
		3/19/2011 1:07:00 PM	3/19/2011 1:17:00 PM			11.55
		3/19/2011 1:07:00 PM	3/19/2011 1:17:00 PM			11.55
2		3/21/2011 2:17:04 PM	3/21/2011 2:37:04 PM			22.02
2		3/25/2011 9:36:00 AM	3/25/2011 12:49:00 PM			209.6
2		3/25/2011 9:36:00 AM	3/25/2011 12:49:00 PM			209.6
		3/26/2011 12:20:00 PM	3/26/2011 3:40:00 PM			225.81
2		3/24/2011 7:09:00 PM	3/25/2011 7:35:00 AM			863.4
2		3/24/2011 7:09:00 PM	3/25/2011 7:35:00 AM			863.4
2		3/25/2011 7:35:00 AM	3/25/2011 7:20:00 PM			777.5
2		3/25/2011 2:21:30 PM	3/25/2011 3:36:15 PM	0	0	777.5
		3/25/2011 2:21:00 PM	3/25/2011 3:36:00 PM			78.75
2		3/28/2011 8:30:00 AM	3/28/2011 1:33:00 PM			266.07
2		3/27/2011 12:37:00 PM	3/27/2011 12:57:01 PM			22.8
2		3/27/2011 2:47:00 PM	3/27/2011 3:07:00 PM			20
2		3/27/2011 2:47:00 PM	3/27/2011 3:07:00 PM	0	0	20
2		3/27/2011 1:43:00 PM	3/27/2011 2:03:00 PM			19.8
2		3/27/2011 1:43:00 PM	3/27/2011 2:03:00 PM			19.8
2		3/30/2011 11:05:23 AM	4/1/2011 11:27:23 AM	0	0	3134
2		3/27/2011 12:37:00 PM	3/27/2011 12:57:00 PM			22.8
2		3/29/2011 9:00:00 AM	3/29/2011 3:40:00 PM			125.41
2		3/29/2011 9:00:00 AM	3/29/2011 3:40:00 PM			125.41
2		3/31/2011 10:55:00 AM	3/31/2011 11:15:00 PM	0	0	23.9
2		3/28/2011 8:33:00 AM	3/28/2011 1:33:00 PM			266.07
2		3/25/2011 2:21:00 PM	3/25/2011 3:36:00 PM			78.75
		3/25/2011 7:20:00 PM	3/26/2011 7:21:00 PM			1658.79
		3/25/2011 7:20:00 PM	3/26/2011 7:21:00 PM			1658.79
2		3/26/2011 2:00:31 PM	3/26/2011 2:21:31 PM	1.14	1.1	84672
2		3/26/2011 2:00:00 PM	3/28/2011 1:20:14 AM			3048
2		3/26/2011 2:00:00 PM	3/28/2011 1:20:00 PM			3048
		3/26/2011 2:00:00 PM	3/26/2011 2:22:00 PM			24
2		3/26/2011 2:00:00 PM	3/28/2011 1:20:00 PM			3048
2		3/26/2011 2:00:55 PM	3/28/2011 1:20:55 PM	0	0	
		3/26/2011 4:05:00 PM	3/26/2011 4:25:00 PM			22.7
2		3/26/2011 5:35:33 PM	3/26/2011 5:55:32 PM			22.8
		3/26/2011 5:35:00 PM	3/26/2011 5:55:00 PM			23
2		4/6/2011 10:00:33 AM	4/7/2011 10:07:33 AM	0	0	1532.6

2		3/26/2011 4:05:51 AM	3/26/2011 4:24:51 AM			23.5
2		3/26/2011 12:20:00 PM	3/26/2011 3:40:00 PM			225.81
2		3/27/2011 12:01:00 PM	3/27/2011 2:29:00 PM			161
2		3/27/2011 12:01:00 PM	3/27/2011 2:29:00 PM			161
2		3/26/2011 7:22:31 PM	3/27/2011 3:40:31 PM	0	0	
2		3/25/2011 7:35:38 AM	3/25/2011 7:20:38 AM	0	0	
2		3/26/2011 7:22:06 PM	3/27/2011 3:40:06 PM	0	0	1410
2		3/27/2011 10:00:00 AM	3/27/2011 4:30:00 AM			390
2		3/27/2011 10:00:00 AM	3/27/2011 4:30:00 PM			390
2		3/27/2011 9:22:00 AM	3/27/2011 1:48:00 PM			284
2		3/27/2011 9:22:00 AM	3/27/2011 1:38:00 PM			284
2		3/27/2011 3:04:10 AM	3/27/2011 3:24:10 AM	0	0	23.4
2		3/28/2011 3:15:00 PM	3/28/2011 3:35:00 PM			24.1
2		3/28/2011 3:15:48 PM	3/28/2011 3:35:48 PM	0	0	
2		3/28/2011 4:42:00 PM	3/28/2011 5:02:00 PM			23.6
2		3/28/2011 3:42:59 PM	3/28/2011 4:02:59 PM	0	0	
2		3/28/2011 12:42:00 AM	3/28/2011 1:02:00 AM			23.6
2		3/28/2011 12:42:48 AM	3/28/2011 1:02:48 AM	0	0	
2		3/27/2011 2:19:52 AM	3/27/2011 2:39:51 AM	0	0	
2		3/27/2011 2:19:23 AM	3/27/2011 2:39:23 AM	0	0	
2		3/27/2011 3:04:26 AM	3/27/2011 3:24:26 AM	0	0	24.3
		3/28/2011 9:00:00 AM	3/28/2011 2:56:00 PM	1.25		396
2		3/28/2011 9:00:00 AM	3/28/2011 2:56:00 PM			396
2		3/27/2011 3:40:00 PM	3/27/2011 10:00:00 PM			442.66
2		3/27/2011 3:40:00 PM	3/27/2011 10:00:00 PM			442.66
2		4/1/2011 8:51:00 AM	4/1/2011 2:30:00 PM			342
2		4/1/2011 8:51:00 AM	4/1/2011 2:30:00 PM			342
2		3/27/2011 6:02:00 AM	3/27/2011 6:00:00 PM			2477
2		3/27/2011 4:02:00 AM	3/27/2011 4:00:00 PM			2477
2		3/28/2011 1:00:00 PM	3/28/2011 2:03:00 PM			67.42
2		3/29/2011 10:24:00 AM	3/29/2011 1:39:00 PM			212
2		3/29/2011 9:26:00 AM	3/29/2011 2:01:00 PM			293
2		3/29/2011 9:26:00 AM	3/29/2011 2:01:00 PM			293
2		3/28/2011 1:00:00 PM	3/28/2011 2:03:00 PM			67.42
2		3/29/2011 10:24:00 AM	3/29/2011 1:39:00 PM			212.1
2		3/31/2011 10:55:28 AM	3/31/2011 11:15:28 AM	0	0	23.9
2		3/29/2011 1:33:00 PM	3/29/2011 1:53:00 PM			20.8
2		3/29/2011 4:43:00 PM	3/29/2011 5:03:00 PM			21.7
2		3/29/2011 4:43:00 PM	3/29/2011 5:03:00 PM			21.7
2		3/29/2011 11:41:00 AM	3/29/2011 12:01:00 PM			23.5
2		3/29/2011 11:41:00 AM	3/29/2011 12:01:00 PM			23.5
2		3/29/2011 1:33:00 PM	3/29/2011 1:53:00 PM			20.8
2		3/29/2011 10:02:00 AM	3/30/2011 10:02:00 AM			1510
2		3/28/2011 10:02:59 AM	3/30/2011 10:02:00 AM	0	0	125.41
2		3/30/2011 9:13:00 AM	3/30/2011 3:45:00 PM			398
2		3/30/2011 9:13:00 AM	3/30/2011 3:45:00 PM			398
2		3/30/2011 10:00:00 AM	3/30/2011 3:30:00 PM			348
2		3/30/2011 10:00:00 AM	3/30/2011 3:30:00 PM			348
2		3/30/2011 8:45:00 AM	3/30/2011 2:30:00 PM			419
2		3/31/2011 8:45:00 AM	3/30/2011 2:35:00 PM			419
2		4/1/2011 11:27:34 PM	4/3/2011 11:30:39 PM	0	0	3124

2		3/30/2011 10:05:00 AM	4/1/2011 10:05:00 AM			3162.5
2		3/30/2011 10:05:00 AM	4/1/2011 10:05:00 AM			3162.15
2		3/31/2011 6:30:00 PM	3/31/2011 7:50:00 PM			152
2		4/1/2011 10:30:00 AM	4/1/2011 11:50:00 AM			152
2		3/31/2011 5:30:00 PM	3/31/2011 10:30:00 PM			330
2		4/1/2011 12:20:00 PM	4/1/2011 12:40:00 PM	0	0	23.2
2		4/1/2011 12:20:00 PM	4/1/2011 12:40:00 PM	0	0	23.2
2		4/2/2011 9:00:00 AM	4/2/2011 2:12:00 PM			364
2		4/1/2011 11:27:00 AM	4/3/2011 11:30:00 AM	0	0	3124
2		4/1/2011 10:05:34 AM	4/2/2011 10:00:34 AM			1552
2		4/1/2011 10:05:00 AM	4/2/2011 10:00:00 AM			1552.5
2		4/2/2011 12:42:00 PM	4/2/2011 1:02:00 PM			24.5
2		3/28/2011 1:20:07 PM	3/30/2011 11:05:00 AM			2993
2		3/28/2011 1:20:10 PM	3/30/2011 1:40:10 AM	0	0	2993.5
2		3/28/2011 3:15:00 PM	3/28/2011 3:25:00 PM			24.1
2		3/28/2011 3:15:51 PM	3/28/2011 3:35:51 PM	0	0	
2		4/6/2011 10:00:51 AM	4/7/2011 10:07:51 AM	0	0	1532.6
2		4/2/2011 9:45:00 AM	4/2/2011 3:00:00 PM			274.3
2		4/2/2011 9:45:00 AM	4/2/2011 11:38:00 AM			274.3
2		4/2/2011 9:06:00 AM	4/2/2011 1:30:00 PM			301.4
2		4/2/2011 9:06:00 AM	4/2/2011 1:30:00 PM			301.4
2		4/2/2011 12:42:00 PM	4/2/2011 1:02:00 PM			24.5
2		4/1/2011 9:30:00 AM	4/1/2011 2:30:00 PM			330
2		4/4/2011 10:37:00 AM	4/3/2011 12:37:00 AM			133
2		4/3/2011 10:37:00 AM	4/3/2011 12:37:00 PM			133
2		4/4/2011 11:00:00 AM	4/4/2011 5:10:00 PM			416.01
2		4/4/2011 11:00:00 AM	4/4/2011 5:10:00 PM			416.01
2		4/3/2011 9:52:00 AM	4/3/2011 2:37:00 PM			363
2		4/3/2011 9:52:00 AM	4/3/2011 2:37:00 PM			363
2		4/4/2011 10:45:39 AM	4/4/2011 11:55:39 AM	0	0	79.5
2		4/4/2011 10:45:09 AM	4/4/2011 11:55:00 AM	0	0	79.5
2		4/3/2011 10:00:00 AM	4/3/2011 12:21:00 PM	0	0	160.74
2		4/3/2011 10:00:00 AM	4/3/2011 12:21:00 PM	0	0	160.74
2		4/3/2011 2:51:00 PM	4/3/2011 4:42:00 PM	0	0	123
2		4/3/2011 10:00:13 AM	4/4/2011 10:23:13 AM	0	0	1662
2		4/3/2011 10:00:11 AM	4/4/2011 10:23:11 AM	0	0	1662
2		4/4/2011 1:41:00 PM	4/4/2011 3:37:00 PM			124.7
2		4/4/2011 1:41:00 PM	4/4/2011 3:37:00 PM			124.7
2		4/2/2011 6:45:00 PM	4/4/2011 6:45:00 PM	0	0	3065.5
2		4/2/2011 7:30:00 PM	4/4/2011 6:45:00 PM	0	0	3065.5
2		4/3/2011 2:51:00 PM	4/3/2011 4:42:00 PM			123
2		4/3/2011 6:09:00 PM	4/4/2011 6:09:00 PM			1567
2		4/4/2011 10:23:00 AM	4/5/2011 10:09:00 AM	0	0	
2		4/4/2011 10:23:00 AM	4/5/2011 10:09:00 AM	0	0	1567
2		4/4/2011 5:45:00 PM	4/4/2011 10:31:00 PM			308.75
2		4/4/2011 5:45:00 PM	4/4/2011 10:31:00 PM			308.75
2		4/4/2011 6:09:00 PM	4/5/2011 6:02:00 PM			1578.5
2		4/4/2011 6:09:00 PM	4/5/2011 6:02:00 PM			1578.5
2		4/2/2011 10:00:26 AM	4/3/2011 10:00:26 AM	0	0	1562
2		4/2/2011 10:00:50 AM	4/3/2011 10:00:50 AM	0	0	1562
2		4/2/2011 9:00:00 AM	4/2/2011 2:12:00 PM			364

2		3/18/2011 2:25:16 PM	3/18/2011 2:55:16 PM	0	0	38.7
2		3/18/2011 3:45:24 PM	3/18/2011 4:15:24 PM	0	0	36
2		3/31/2011 2:38:00 PM	3/31/2011 2:58:00 AM	0	0	24.4
2		3/31/2011 2:38:00 PM	3/31/2011 2:58:00 PM	0	0	24.4
2		3/31/2011 4:15:00 PM	3/31/2011 4:35:00 PM	0	0	25.4
2		3/31/2011 4:15:00 PM	3/31/2011 4:35:00 PM			25.4
2		3/31/2011 1:35:00 PM	3/31/2011 1:55:00 PM	0	0	22.5
2		3/31/2011 1:35:00 PM	3/31/2011 1:55:00 PM	0	0	22.5
2		4/1/2011 3:36:00 PM	4/1/2011 3:56:00 PM	0	0	24.5
		3/17/2011 7:35:00 AM	3/18/2011 9:41:00 AM			1817
20	Square Ce	3/16/2011 1:57:00 PM	3/17/2011 11:38:00 AM			991.225
2		3/17/2011 11:39:00 AM	3/18/2011 1:58:00 PM	0	0	1327.2
4		3/17/2011 11:57:29 AM	3/18/2011 2:05:00 PM	0	0	14896
2		3/17/2011 1:12:28 PM	3/18/2011 3:00:00 PM	0	0	1733.82
4		3/17/2011 1:16:36 PM	3/18/2011 3:10:36 AM	0	0	18648
2		3/20/2011 5:29:00 PM	3/20/2011 5:49:00 PM			21.77
		3/17/2011 1:12:00 PM	3/18/2011 3:00:00 PM			1733.82
		3/17/2011 11:39:00 AM	3/18/2011 1:58:00 PM			1327.2
2		3/16/2011 1:57:00 PM	3/17/2011 11:38:00 AM			991.225
2		3/17/2011 12:15:06 PM	3/17/2011 12:45:06 PM	0	0	39
2		3/17/2011 2:20:11 PM	3/17/2011 2:50:11 PM	0	0	36
2		3/17/2011 12:15:00 PM	3/17/2011 12:45:00 PM			39
2		3/17/2011 2:20:00 PM	3/17/2011 2:50:00 PM			36
2		4/1/2011 3:36:00 PM	4/1/2011 3:56:00 PM	0	0	24.5
2		4/1/2011 10:30:00 AM	4/1/2011 11:50:00 AM			152

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

From: LIA07 Hoc
Sent: Friday, April 08, 2011 6:36 AM
To: LIA07 Hoc; Batkin, Joshua; Borchardt, Bill; Bradford, Anna; Coggins, Angela; Cohen, Shari; Collins, Elmo; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Jaczko, Gregory; Johnson, Michael; Leeds, Eric; Loyd, Susan; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walker, Dwight; Walls, Lorena; Weber, Michael
Subject: Go Book Update - 0600 EDT, April 8, 2011
Attachments: Pages 1-5 ET Chronology 4.8.11 0600EDT.pdf; NRC Status Update 4.8.11--0430EDT.pdf; April 8 0600 EDT one pager.pdf

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

The update includes:

- The 0430 EDT, 04/08/11 Status Update
- The 0600 EDT, 4/8/11 One-pager/Turnover sheet
- The latest ET Chronology
- *There were no new applicable TEPCO press releases since the last update.*

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

-Jim

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

KICKK - 151

From: LIA02 Hoc
Sent: Saturday, April 09, 2011 6:54 AM
To: LIA02 Hoc; Mamish, Nader; Doane, Margaret
Cc: Abrams, Charlotte; Wittick, Brian; Afshar-Tous, Mugeh; 'ShafferMR@state.gov'; Bloom, Steven; Schwartzman, Jennifer; Tobin, Jennifer; Mayros, Lauren; Jones, Andrea; English, Lance; Smirolodo, Elizabeth; Young, Francis; Henderson, Karen; Ramsey, Jack; Shepherd, Jill; Baker, Stephen; Emche, Danielle; Fragoyannis, Nancy; LIA03 Hoc; Stahl, Eric; Owens, Janice; Fehst, Geraldine; Foggie, Kirk; Breskovic, Clarence; LIA08 Hoc; LIA06 Hoc
Subject: One Pager for April 9, 2011
Attachments: MDoane report 4-9 (5).docx

~~OFFICIAL USE ONLY~~

Attached is One Page Summary for April 9, 2011.

~~OFFICIAL USE ONLY~~

~~Official Use Only – Foreign Government Information~~

Saturday, April 9, 2011

The daily NISA/TEPCO meeting continued to be productive, with a high-level exchange between both sites. Notably, during the meeting, NISA advised the U.S. side that Prime Minister Kan will address the Japanese people on Monday, 11 April. This date marks the one-month anniversary since the earthquake and tsunami. NISA went at length to explain that Prime Minister would like to deliver a positive message to the Japanese people and that the Government of Japan plans to coordinate this message with Ambassador Roos and also with Ambassador Fujisaki (in Washington). The main objective of this coordination is to ensure that the position of the two countries is consistent.

There are no meetings scheduled with NISA/TEPCO (or any other representatives of the GOJ) tomorrow, 10 April.

Chuck and Elmo visited Yokota Air Base today and met with members of United States Force Japan (USFJ). USFJ requested Chuck and Elmo visit the base to have direct discussions concerning the status of Fukushima Daiichi. Based on a brief discussion with them upon their return, they said the visit was positive and productive.

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From: LIA02 Hoc
Sent: Saturday, April 09, 2011 1:23 PM
To: ET07 Hoc
Subject: Japan Traveler Checklist
Attachments: Travel to Japan Checklist-UPDATED!.docx

KKKK-153

International Travel Checklist

Pre-Travel Activities	
	Completed
1. Passport: Make sure either personal or official passport is valid for at least 6 months after the date of completion of the trip, if you're traveling with USAID, a visa is not required. Contact Steve Dembek if you need assistance 301-415-2342	
2. Ascertain any health immunization recommendations: Contact the NRC Health Unit (415-8400) to consult on possible medical issues and precautions, including the possibility of getting recommended inoculations or other medications and educational materials. Travelers can check recommended immunizations and other health advisories at http://www.cdc.gov/travel/ .	
3. Obtain international Blackberry – Contact Karen Jackson at 415-6398	
4. Country clearance cable information Format: Format is available at OIP SharePoint (http://portal.nrc.gov/OCM/ip/travel/default.aspx) Complete the requested items. Place of Birth should be exactly the same as shown in your passport. Include your security clearance information and follow the directions included.	
5. Obtain dosimetry and KI tablets. In order to get dosimeter, traveler needs to contact a Radiation Safety Officer. Contact Undine Shoop at 301-415-2063 or your Regional RSO.	
6. USAID Needs the following information (send to: RMTPACTSU_ELNRC@ofda.gov, or phone: (202) 236-6417, 202-712-4383): For anyone deploying to Japan we (the NRC USAID reps will need the following): Full Name Home Address SSN Passport # Date and Place of Birth Issue Date of Passport Expiration Date of Passport Place of Passport Issuance Finally, since the Travel Authority will be USAID we need the following Banking information: Account Name Account Number Routing Number	

7. Receive Cultural Briefing by OIP – Contact Nader Mamish 301-415-3244 to arrange.	
8. Recommend contact with EAP – Available 27/7 at 1-800-869-0276	
9. Recommended Business Attire – Normal attire in Japan is business and ties are worn all the time. Higher end business casual would also be acceptable in some situations.	
10. Business cards – Contact your office secretary.	

LT Turnover Notes (1500 - 2300 shift)
Andy Campbell
4/10/2011

1. Review task tracker, LT log, LT chronology.

Task tracker item#1 is in process. LT received the draft document "Guidance for the Return of U.S. Citizens to Areas around Fukushima Daiichi NPP" LT needs to review and provide comments as appropriate.

2. Consortium call (2000 hrs, 4/10)

Action: No follow-up for LT. No agenda or meeting minutes required. NRC Japan team has taken over maintenance of the spreadsheet. We have worked with the NRC Japan team to get their distribution list to match ours and are maintaining a copy here just in case. NRC Japan team sent out the updated spreadsheet in advance of tonight's call (see Eric Stahl email at 0241 on 4/9/11). ET Director will still run phone call. LT developed notes from Consortium call based on note taker input and emailed to Japan Team and cc'd HQ teams & individuals.

3. ENSURE ALL EMAILS go to FOIA folder. LT team has task for each workstation send all sent and received email for the day at midnight each night. Action for 2300 to 0700 shift. Sent LIA06 emails to FOIA around 0915 on 4/10/11.

4. Meeting held on 4/7/11 to discuss NY Times article and the leak of the RST document. NRC is on the hook to provide lessons learned and corrective actions in the next CIVITS (sp?) call. Gave the ET a draft of talking points on 4/7/11 to be used for the next CIVITS meeting. Sent tickler email on 4/10/11 to Roy Zimmerman, Marty Virgilio, Mike Weber, and ET01 to get comments on the draft talking points so that Task Tracker #4181 can be closed. See email from Roy Zimmerman at 18:45 indicating note is sufficient at this time. Not clear if sufficient to close out Task Tracker # 4181.

5. From ET Director: 1) make sure that any documents issued that have big P policy implications, e.g., could lead to major decisions, are passed by the ET before sending out, 2) look for opportunities to share with others the need to respect OOU. Sent reminder to all LT members 4/7/11.

6. On 4/10/11, forwarded emails from all LT machines to LIA08 (LT Coordinator) and made folders and rules such that forwarded emails go to correspondingly named folders on the LIA08 machine to facilitate one person monitoring all LT incoming emails as staff transitions.

7. Follow-up discussion with Chuck Casto and Elmo Collins after Chairman call at 18:30. NRC HQ staff present included: Marty Virgilio, Cynthia Carpenter, Andy Campbell, Stacey Rosenberg, Tom Blount, Allen Howe present. Discussion identified range of items and issues requiring follow-up or specific action. Anthony McMurtry input appropriate action items into Task Tracker.

8. Briefing Slide Package from Japan (presented by Shaw to NRC Japan Team last week) delivered to NRC mailroom on Friday 4/8. LT to follow-up on slides.

9. Email to US AID Response Manager and AID Administrative Coordinator: The next U.S. NRC Team is ready to leave for Japan on Tuesday, April 12. The following six NRC experts should be considered "emergent" (sic). Please expedite their travel.

10. Jim Andersen, OEDO provided email with Process for assigning action items from Ops Centers to Program Offices through OEDO.

KICK-154

From: LIA02 Hoc
Sent: Monday, April 11, 2011 6:54 AM
To: LIA08 Hoc; LIA03 Hoc; LIA10 Hoc
Subject: FW: Travelers to Japan

From: Larson, Emily
Sent: Monday, April 11, 2011 6:54 AM
To: LIA02 Hoc
Subject: Travelers to Japan

Is there a solid number for how many NRC staff will be travelling to Japan this week?

Thanks,

Emily

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

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

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

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

All,

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

Full Name
Home Address
SSN

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

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

Account Name
Account Number
Routing Number

Emergency Name and Number

Airport

KKKK-156

Thank you,

Steve Bloom

From: LIA02 Hoc
Sent: Wednesday, April 13, 2011 7:15 AM
To: Castleman, Patrick; Hipschman, Thomas; Orders, William; Franovich, Mike; Snodderly, Michael; Wittick, Brian; Jones, Cynthia
Cc: Doane, Margaret; Mamish, Nader; Abrams, Charlotte; Schwartzman, Jennifer; Kreuter, Jane; Larson, Emily; LIA06 Hoc; LIA08 Hoc; Whitney, James
Subject: RE: IAEA ENAC rept for April 13 , 2011
Attachments: Letter - Summary of reactor unit status at 13-April 0000 UTC[1].pdf

Attached is the IAEA ENAC report for April 13, 2011.

This information is being provided in response to several Commission Offices request.

Please note the sensitivity of the information.

From: LIA06 Hoc
Sent: Friday, April 15, 2011 1:02 PM
To: LIA08 Hoc
Attachments: LT Turnover Note1.doc

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

From: LIA06 Hoc
Sent: Sunday, April 17, 2011 12:25 PM
To: LIA08 Hoc
Subject: FW: USNRC Emergency Operations Center Status Update
Attachments: USNRC Earthquake-Tsunami Update 041711 1200EDT.pdf

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

From: LIA08 Hoc
Sent: Sunday, April 17, 2011 12:25 PM
Subject: USNRC Emergency Operations Center Status Update

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

KKKK-159

From: LIA08 Hoc
Sent: Sunday, April 17, 2011 1:40 AM
To: ET07 Hoc
Subject: FW: Press Releases: Remarks Before Meeting With Japanese Foreign Minister Takeaki Matsumoto

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

From: LIA01 Hoc
Sent: Sunday, April 17, 2011 1:39 AM
To: LIA08 Hoc; LIA11 Hoc
Subject: FW: Press Releases: Remarks Before Meeting With Japanese Foreign Minister Takeaki Matsumoto

From: U.S. Department of State [<mailto:usstatebpa@subscriptions.fcg.gov>]
Sent: Sunday, April 17, 2011 1:38 AM
To: LIA01 Hoc
Subject: Press Releases: Remarks Before Meeting With Japanese Foreign Minister Takeaki Matsumoto

Press Releases: Remarks Before Meeting With Japanese Foreign Minister Takeaki Matsumoto
Sun, 17 Apr 2011 00:11:03 -0500

Remarks Before Meeting With Japanese Foreign Minister Takeaki Matsumoto

Remarks
Hillary Rodham Clinton
Secretary of State
Tokyo, Japan
April 17, 2011

SECRETARY CLINTON: Minister, it is a great honor for me to be here on behalf of my country to demonstrate our very strong bonds of friendship that go very deep into the hearts of both of our people. There has been a great outpouring of concern and sympathy and admiration for the great resilience and spirit that the Japanese people have shown throughout this very difficult experience. I thank you for your very kind words about our government and we both were fortunate to have two ambassadors who work so closely - Ambassador Roos here in Tokyo, and Ambassador Fujisake in Washington - to ensure we were in touch and coordinating. And I appreciated meeting with you as well. I think that both our government and our U.S. forces here in Japan are very proud that we could stand by you during this period.

PRN: 2011/T44-07

KKKK-160

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From: LIA10 Hoc
Sent: Sunday, April 17, 2011 12:25 PM
To: LIA08 Hoc; LIA02 Hoc; LIA03 Hoc
Subject: FW: USNRC Emergency Operations Center Status Update
Attachments: USNRC Earthquake-Tsunami Update 041711 1200EDT.pdf

From: LIA03 Hoc
Sent: Sunday, April 17, 2011 12:25 PM
To: LIA08 Hoc; LIA02 Hoc; LIA10 Hoc
Subject: FW: USNRC Emergency Operations Center Status Update

From: LIA08 Hoc
Sent: Sunday, April 17, 2011 12:25 PM
Subject: USNRC Emergency Operations Center Status Update

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

KKKK-161

Scott, Michael

From: Scott, Michael
Sent: Thursday, March 17, 2011 4:17 PM
To: Skarda, Raymond
Cc: Zaki, Tarek
Subject: RE: YOUR TRAVEL APP

OK – thanks.

From: Skarda, Raymond
Sent: Thursday, March 17, 2011 3:56 PM
To: Scott, Michael
Cc: Zaki, Tarek
Subject: FW: YOUR TRAVEL APP

Mike,

I've was able to revise flight for \$200. However given budget concerns and uncertainties let's let this one die, so others can train and travel – especially with Japan issues. There seems to be other difficulties with method of invoicing the transaction as well. I'll plan for providing career development plans to management in more deliberate and thoughtful manner.

Thanks,

Ray

From: Scott, Michael
Sent: Wednesday, March 16, 2011 7:56 AM
To: Skarda, Raymond
Cc: Zaki, Tarek
Subject: FW: YOUR TRAVEL APP

I also don't recall seeing your iLearn application processed for the training fees. Have I seen it and just forgotten?

From: Scott, Michael
Sent: Wednesday, March 16, 2011 7:52 AM
To: Skarda, Raymond
Cc: Zaki, Tarek
Subject: YOUR TRAVEL APP

Ray:

I returned your travel app to you. You have no airline reservation, and \$2000 for round trip air fare to NC is not a number I can sign off. Please fix.

I do not know whether the travel will be approved given the budget/funding issues, but I'll send the app on once you fix it, and PMDA will help us decide whether to actually approve this.

Mike

From: LIA08 Hoc
Sent: Monday, April 18, 2011 12:19 PM
To: Batkin, Joshua; Borchardt, Bill; Bradford, Anna; Coggins, Angela; Cohen, Shari; Collins, Elmo; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Jaczko, Gregory; Johnson, Michael; Leeds, Eric; Loyd, Susan; Monninger, John; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walker, Dwight; Walls, Lorena; Weber, Michael
Attachments: USNRC Earthquake-Tsunami Update 041811 1200EDT.docx

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

KKKK-163

From: LIA06 Hoc
Sent: Tuesday, April 19, 2011 11:45 AM
To: LIA08 Hoc
Subject: FW: USNRC Earthquake-Tsunami Update 041911 DRAFT 1200EDT
Attachments: USNRC Earthquake-Tsunami Update 041911 DRAFT 1200EDT.pdf

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

From: LIA08 Hoc
Sent: Tuesday, April 19, 2011 11:45 AM
To: A Green; A Rock; Al Coons; Aleshia Duncan; alexancg; Anthony Herbold; Appleman Binkert; B Green; B Russo; Bill King; Bill King2; Bruce Howard; C Lay; C Noser; C Ops; Charles Burrows; Charles Donnell; Christopher Meadow; Clinton Carroll; Conrad Burnside; D Drakeley; D May; D Murakami; D Webb; Damian Peko; Dan Feighert; Darrell Hammons; DHS Ops; DOE NIT; DOT; DTRA; DTRA; Dudek; E Wright; Elmer Naples; EOP; EPA; EPA2; Eric Sinibaldi; F Lewis; G Szeto; G Whitmire; George Higdon; gregopk; Gregory Simonson; Gretchen McCoy; H; Harry Sherwood; HHS; I Clark; Intel DIA; J Barnes; J Bartlett; J Moeller; J Noonkester; J Szymanski; J Tippets; James Purvis; Japan Embassy Task Force; Japan Pentagon; Jason CIA; Jason Pepin; Jeffrey Conran; Jeremy Demott; Jeremy Morrow; Jeremyft1; Jim Kish; Johanna Berkey; John Holdren; Joyce Connery; K Donald; K Gonzalez; K Ousley; Karyn Keller; Kyle Viayra; L Mayer; Lee Nickel; Lee-Jake Strunk; Lisa; Lisa Hammond; Lukas McMichael; M Huchla; M Kerber; M Lansley; M Thon; M Thon2; maceck; MARFORPAC CAT All Hazards Div; MARFORPAC CAT G2; Mark Shaffer; markwb2; Marshall Shull; Michelle Ralston; Nan Calhoun; Navy; NICC; NMIC; NOC; NOC Duty Director; Nulcear SSA; P Gardner; pentagon; Peter Lyons; Phillip Barks; R Roesler; R Schueneman; Rebecca Thomson; roberhh; Ron Cherry; Ron McCabe; S Basile; S Buntman; S Levy; scotc1; Seamus O'Boyle; seiden; state; Stephen Trautman; Steve Colman; Steve Horwitz; T Gatling; T Roberts; Thomas Conran; Thomas Zerr; Tim Greten; Timothy Hitzelberger; Trent Hughes; Troy Heytens; USDA, John; USMC; Vanessa Quinn; Victoria Kinsey; W Cluff; W Young; Will Friese; William Harding; William Webb; A Aviles; A Brown; A Estes; A Hough; A Tribble; B goldberg; B Moffat; B Perry; B Woo; Beavers, Shane; Brinser, Andrew; Brooks, Andrae; Brown, Michael; C Fiore; C Good; C Kim; Carlos Islas; CPF CATN5; Craig Gaddis; D Fletcher; D Putthoff; D Scully; D Smith; D Souza; D Wade; D Williams; David Graves; DOE DART; E Fiser; E kaye; E Price; E Shelland; E Train; Elder, Troy M SGT MIL USA USARPAC; Eric Wright; F Bantell; Fossum, Sgt Zachary; Guathier, Ronald; H Zito; Hickam; Hickam; J Blankenburg; J Kreykes; J McCallister; J Rhodes; J Rivera; J Scarbrough; J Soderbeck; J Stewart; J Trussler; James Williams; JR Haley; JTF505-MAIN-JOC-J2; JTF505-MAIN-JOC-J2-INTEL-ANAY; K Bollow; K Bollow; K Tomlinson; Koluch, SSgt Eric; L Bolling; L Elkins; L Heinrich; L Walter; M Howsare; M Kabbur; M Nguyen; M Opfer; M Taafe; M Thon; M Thon; Marina Llewellyn; Michael Anderson; Micheael Eberlein; Monaghan, Dylan; N Albritton; N Albritton; NCMI Ops; Office of Secretary of Defense Watch Officer ; Olson, Niels; P Almquist; P Higginbotham; P Higgins; P Lyons; P Smalley; P Somboonpakron; PACOM; PACOM; Pasit Sombookpakron; Powers, Jeffrey; R Backley; R Fisher; R Garrett; R Neff; R Stephenson; R Tashma; Richard, Sgt William; Robert Duke; Robert P; RST01 Hoc; RST01B Hoc; RST03 Hoc; S Aoki; S Jerabek; Sean Basile; Shirey, Sgt Eric; Simmers, Keith; Spencer Nordgran; Spurlock, Kenneth; Stephen Greco; T Baden; T Lowman; T Miller; T Reeves; T Reeves; T True; Tovar, SSgt Eric; USAFJ.A2@yokota.af.mil; USFJ; USFJ Intel; V Raphael; Valerie Makino; Vaughn, Sgt Jerrod; Walter Hokett; Wanda Ayuso; William Brysacz; Andersen, James; Anderson, Joseph; Ash, Darren; Baggett, Steven; Barker, Allan; Batkin, Joshua; Boger, Bruce; Borchardt, Bill; Bradford, Anna; Brenner, Eliot; Breskovic, Clarence; Smith, Brooke; Brown, Frederick; Brown, Milton; Bubar, Patrice; Burns, Stephen; Camper, Larry; Carpenter, Cynthia; Castleman, Patrick; Ader, Charles; Casto, Chuck; Coggins, Angela; Collins, Elmo; ConE_Resource; Copeland, Douglas; Correia, Richard; Craffey, Ryan; Dapas, Marc; Dean, Bill; Decker, David; Diaz-Sanabria, Yoira; Dickman-Disabled-11/14/2010, Paul; Dorman, Dan; Droggitis, Spiros; Dyer, Jim; English, Lance; ET02 Hoc; Evans, Michele; Franovich, Mike; Frye, Timothy; Garmon, David; Apostolakis, George; Gibbs, Catina; Giitter, Joseph; Gott, William; Grobe, Jack; Hahn, Matthew; Haney, Catherine; Harrington, Holly; Hipschman, Thomas; Hoc, PMT12; Holahan, Gary; Holahan, Patricia; HOO Hoc; Howe, Allen; Howell, Art; Howell, Linda; Issa, Alfred; Itzkowitz, Marvin; Foster, Jack; Jackson, Donald; Jaczko, Gregory; Johnson, Andrea; Johnson, Michael; Jones, Cynthia; Kahler, Robert; King, Mark;

KKKK-164

Foggie, Kirk; Kock, Andrea; Kozal, Jason; Leeds, Eric; LIA01 Hoc; LIA02 Hoc; LIA03 Hoc; LIA06 Hoc; LIA08 Hoc; LIA11 Hoc; Logaras, Harral; Loyd, Susan; Magwood, William; Maier, Bill; Marshall, Jane; Marshall, Michael; McCree, Victor; McDermott, Brian; McIntosh, Angela; McNamara, Nancy; Michalak, Paul; Miller, Charles; Miller, Chris; Monninger, John; Morris, Scott; Nease, Rebecca; Nieh, Ho; NRCHQ; NSIR_DDSP_ILTAB_Distribution; Ordaz, Vonna; Orders, William; OST05 Hoc; Ostendorff, William; Pace, Patti; Patel, Jay; Pearson, Laura; Pederson, Cynthia; Plisco, Loren; Powell, Amy; Quichocho, Jessie; R1 IRC; R2 IRC; R3 IRC; R4 IRC; Reddick, Darani; Reyes, Luis; Devercelly, Richard; Nelson, Robert; ROO hoc; Rothschild, Trip; Satorius, Mark; Schmidt, Rebecca; Sharkey, Jeffry; Sheron, Brian; Sigmon, Rebecca; Snodderly, Michael; Sosa, Belkys; Speiser, Herald; Svinicki, Kristine; Tabatabai, Omid; Thoma, John; Thomas, Eric; Tifft, Doug; Kolb, Timothy; Ulses, Anthony; Nakanishi, Tony; Tracy, Glenn; Trapp; Trapp, James; Trojanowski, Robert; Turtill, Richard; Uhle, Jennifer; Virgilio, Martin; Warnick, Greg; Warren, Roberta; Weber, Michael; Westreich, Barry; Wiggins, Jim; Cook, William; Williams, Kevin; Wittick, Brian; Woodruff, Gena; Zimmerman, Roy; Zimmerman, Roy; Zorn, Jason; Borchardt, Bill; Cohen, Shari; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Hudson, Sharon; Schwarz, Sherry; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walker, Dwight; Walls, Lorena; Weber, Michael

Subject: USNRC Earthquake-Tsunami Update 041911 DRAFT 1200EDT

From: LIA06 Hoc
Sent: Tuesday, April 19, 2011 12:52 PM
To: LIA08 Hoc
Subject: FW: USNRC Earthquake-Tsunami Update 041911 Revision 1, 1300 EDT
Attachments: USNRC Earthquake-Tsunami Update 041911 Revision 1, 1300 EDT.pdf

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

From: LIA08 Hoc
Sent: Tuesday, April 19, 2011 12:52 PM
To: OST01 HOC; A Green; A Rock; Al Coons; Aleshia Duncan; alexancg; Anthony Herbold; Appleman Binkert; B Green; B Russo; Bill King; Bill King2; Bruce Howard; C Lay; C Noser; C Ops; Charles Burrows; Charles Donnell; Christopher Meadow; Clinton Carroll; Conrad Burnside; D Drakeley; D May; D Murakami; D Webb; Damian Peko; Dan Feighert; Darrell Hammons; DHS Ops; DOE NIT; DOT; DTRA; DTRA; Dudek; E Wright; Elmer Naples; EOP; EPA; EPA2; Eric Sinibaldi; F Lewis; G Szeto; G Whitmire; George Higdon; gregopk; Gregory Simonson; Gretchen McCoy; H; Harry Sherwood; HHS; I Clark; Intel DIA; J Barnes; J Bartlett; J Moeller; J Noonkester; J Szymanski; J Tippetts; James Purvis; Japan Embassy Task Force; Japan Pentagon; Jason CIA; Jason Pepin; Jeffrey Conran; Jeremy Demott; Jeremy Morrow; Jeremyft1; Jim Kish; Johanna Berkey; John Holdren; Joyce Connery; K Donald; K Gonzalez; K Ousley; Karyn Keller; Kyle Viayra; L Mayer; Lee Nickel; Lee-Jake Strunk; Lisa; Lisa Hammond; Lukas McMichael; M Huchla; M Kerber; M Lansley; M Thon; M Thon2; maceck; MARFORPAC CAT All Hazards Div; MARFORPAC CAT G2; Mark Shaffer; markwb2; Marshall Shull; Michelle Ralston; Nan Calhoun; Navy; NICC; NMIC; NOC; NOC Duty Director; Nulcear SSA; P Gardner; pentagon; Peter Lyons; Phillip Barks; R Roesler; R Schueneman; Rebecca Thomson; roberhh; Ron Cherry; Ron McCabe; S Basile; S Buntman; S Levy; scotc1; Seamus O'Boyle; seiden; state; Stephen Trautman; Steve Colman; Steve Horwitz; T Gatling; T Roberts; Thomas Conran; Thomas Zerr; Tim Greten; Timothy Hitzelberger; Trent Hughes; Troy Heytens; USDA, John; USMC; Vanessa Quinn; Victoria Kinsey; W Cluff; W Young; Will Frieze; William Harding; William Webb; A Aviles; A Brown; A Estes; A Hough; A Tribble; B goldberg; B Moffat; B Perry; B Woo; Beavers, Shane; Brinser, Andrew; Brooks, Andrae; Brown, Michael; C Fiore; C Good; C Kim; Carlos Islas; CPF CATN5; Craig Gaddis; D Fletcher; D Putthoff; D Scully; D Smith; D Souza; D Wade; D Williams; David Graves; DOE DART; E Fiser; E kaye; E Price; E Shelland; E Train; Elder, Troy M SGT MIL USA USARPAC; Eric Wright; F Bantell; Fossum, Sgt Zachary; Guathier, Ronald; H Zito; Hickam; Hickam; J Blankenburg; J Kreykes; J McCallister; J Rhodes; J Rivera; J Scarbrough; J Soderbeck; J Stewart; J Trussler; James Williams; JR Haley; JTF505-MAIN-JOC-J2; JTF505-MAIN-JOC-J2-INTEL-ANAY; K Bollow; K Bollow; K Tomlinson; Koluch, SSgt Eric; L Bolling; L Elkins; L Heinrich; L Walter; M Howsare; M Kabbur; M Nguyen; M Opfer; M Taafe; M Thon; M Thon; Marina Llewellyn; Michael Anderson; Micheael Eberlein; Monaghan, Dylan; N Albritton; N Albritton; NCMI Ops; Office of Secretary of Defense Watch Officer ; Olson, Niels; P Almquist; P Higginbotham; P Higgins; P Lyons; P Smalley; P Somboonpakron; PACOM; PACOM; Pasit Sombookpakron; Powers, Jeffrey; R Backley; R Fisher; R Garrett; R Neff; R Stephenson; R Tashma; Richard, Sgt William; Robert Duke; Robert P; RST01 Hoc; RST01B Hoc; RST03 Hoc; S Aoki; S Jerabek; Sean Basile; Shirey, Sgt Eric; Simmers, Keith; Spencer Nordgran; Spurlock, Kenneth; Stephen Greco; T Baden; T Lowman; T Miller; T Reeves; T Reeves; T True; Tovar, SSgt Eric; USAFJ.A2@yokota.af.mil; USFJ; USFJ Intel; V Raphael; Valerie Makino; Vaughn, Sgt Jerrod; Walter Hokett; Wanda Ayuso; William Brysacz; Andersen, James; Anderson, Joseph; Ash, Darren; Baggett, Steven; Barker, Allan; Batkin, Joshua; Boger, Bruce; Borchardt, Bill; Bradford, Anna; Brenner, Eliot; Breskovic, Clarence; Smith, Brooke; Brown, Frederick; Brown, Milton; Bubar, Patrice; Burns, Stephen; Camper, Larry; Carpenter, Cynthia; Castleman, Patrick; Ader, Charles; Casto, Chuck; Coggins, Angela; Collins, Elmo; ConE_Resource; Copeland, Douglas; Correia, Richard; Craffey, Ryan; Dapas, Marc; Dean, Bill; Decker, David; Diaz-Sanabria, Yoira; Dickman-Disabled-11/14/2010, Paul; Dorman, Dan; Droggitis, Spiros; Dyer, Jim; English, Lance; ET02 Hoc; Evans, Michele; Franovich, Mike; Frye, Timothy; Garmon, David; Apostolakis, George; Gibbs, Catina; Giitter, Joseph; Gott, William; Grobe, Jack; Hahn, Matthew; Haney, Catherine; Harrington, Holly; Hipschman, Thomas; Hoc, PMT12; Holahan, Gary; Holahan, Patricia; HOO Hoc; Howe, Allen; Howell, Art; Howell, Linda; Issa, Alfred; Itzkowitz, Marvin; Foster, Jack; Jackson, Donald; Jaczko, Gregory; Johnson, Andrea; Johnson, Michael; Jones, Cynthia; Kahler, Robert; King, Mark;

Foggie, Kirk; Kock, Andrea; Kozal, Jason; Leeds, Eric; LIA01 Hoc; LIA02 Hoc; LIA03 Hoc; LIA06 Hoc; LIA08 Hoc; LIA11 Hoc; Logaras, Harral; Loyd, Susan; Magwood, William; Maier, Bill; Marshall, Jane; Marshall, Michael; McCree, Victor; McDermott, Brian; McIntosh, Angela; McNamara, Nancy; Michalak, Paul; Miller, Charles; Miller, Chris; Monninger, John; Morris, Scott; Nease, Rebecca; Nieh, Ho; NRCHQ; NSIR_DDSP_ILTAB_Distribution; Ordaz, Vonna; Orders, William; OST05 Hoc; Ostendorff, William; Pace, Patti; Patel, Jay; Pearson, Laura; Pederson, Cynthia; Plisco, Loren; Powell, Amy; Quichocho, Jessie; R1 IRC; R2 IRC; R3 IRC; R4 IRC; Reddick, Darani; Reyes, Luis; Devercelly, Richard; Nelson, Robert; ROO hoc; Rothschild, Trip; Satorius, Mark; Schmidt, Rebecca; Sharkey, Jeffry; Sheron, Brian; Sigmon, Rebecca; Snodderly, Michael; Sosa, Belkys; Speiser, Herald; Svinicki, Kristine; Tabatabai, Omid; Thoma, John; Thomas, Eric; Tifft, Doug; Kolb, Timothy; Ulses, Anthony; Nakanishi, Tony; Tracy, Glenn; Trapp; Trapp, James; Trojanowski, Robert; Turtill, Richard; Uhle, Jennifer; Virgilio, Martin; Warnick, Greg; Warren, Roberta; Weber, Michael; Westreich, Barry; Wiggins, Jim; Cook, William; Williams, Kevin; Wittick, Brian; Woodruff, Gena; Zimmerman, Roy; Zimmerman, Roy; Zorn, Jason; Borchardt, Bill; Cohen, Shari; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Hudson, Sharon; Schwarz, Sherry; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walker, Dwight; Walls, Lorena; Weber, Michael

Subject: USNRC Earthquake-Tsunami Update 041911 Revision 1, 1300 EDT

To: Mamish, Nader; Doane, Margaret
Cc: Abrams, Charlotte
Subject: Weekend Staffing in OPs Center

Good Evening,

Tonight's LT Coordinator, Rich Correia, just emerged from the ET meeting room with Roy and asked those of us here whether we thought our services were needed in the OP Center this weekend. At an earlier meeting, Marty Virgilio met with Roy, when they discussed scaling back the Op Center staff for weekend work at least.

I've been here since 3 p.m., and am scheduled to be here both Saturday and Sunday from 3 to midnight. All I have done is forward a few IAEA emails to appropriate parties. I will write up the call from Eric and Danielle

KKKK-165

1～3号炉心の冷却方法の検討について(案)

平成 23 年 3 月 23 日 Rev1

合 同 対 策 チ ー ム

1. はじめに

1～3号炉について、消防ポンプにより海水注入を継続して行うことによって冷却性を保持しているところであるが、格納容器ドライベントまで水位が上昇し、ベント口を閉塞すると外部注水が不能となる。その限度は、プラントメーカーによれば2号炉、3号炉が最も早く、3月25日と予想されている。

また、炉心損傷により水の放射線分解が促進され、格納容器、圧力容器ともに水素爆発を誘引する懸念があることから、注意する必要がある。

このため、電源復旧による既存の海水ポンプ、残留熱除去系などの冷却設備を活用して冷却する方法を基本としながらも、地震及び津波による影響を踏まえ、代替冷却手法を速やかに検討し、所要の対策を速やかに行い、冷温停止状態に移行させる必要がある。

2. 基本方針

- ① 水位を管理して、格納容器ベントを閉塞しない範囲で外部から注水して冷却する。
- ② 注水を海水から淡水へ速やかに変更する。
- ③ 常に水素爆発について注意を払う。その一環として、格納容器内の雰囲気水を水素爆発しない窒素に置換する。
- ④ 水位が格納容器ベントを超える前に注水を停止し、沸騰による潜熱による冷却を行う。蒸気はベント口から放出し、蒸発した水は外部から給水する「Feed and Breed」で当座をしのぐ。
- ⑤ 追加の代替冷却方法として、格納容器上部の給水による冷却、換気空調系による冷却を検討する。
- ⑥ RHR 復旧まで、既存の配管を活用して内部循環配管を設置し、代替ヒートシンクによる冷却を行う。
- ⑦ 作業の計画に当たっては、環境への放射能低減、従業員被ばく量の低減、作業効率性を考慮する。

3. 準備作業

3.1. 概略計画の策定

冷温停止までの全体プロセスを明確にするとともに、個別プロセスの期限、当該プロセスの責任者を決定する。

工程	～3月26日	～3月末	～4月	4月以降
計画策定				
外部注水の継続				
水位監視				
Feed and Breed への切替				
海水注水				
淡水への切替				
窒素ローリー手配				
窒素置換				
資材調達				
各種検討				
C/V 耐衝撃圧耐力				
炉水放射線強度				
代替冷却法の検討				
放射線強度マップ				
RHR, 海水系ポンプの復旧				▼

3.2. 資材調達

RHR が使用できないことを前提に、代替冷却のための資材調達計画を策定する。

- ① 気化器付窒素タンクローリー仕様の明確化及び手配 (TEPCO/NISA)
- ② 仮設海水ポンプ 3 台 (TEPCO)
- ③ 代替冷却配管 (TEPCO)
- ④ 熱交換器 (TEPCO)
- ⑤ 一次遮蔽等放射線防護対策 (TEPCO)

3.3. 検討事項

- ① 格納容器の耐衝撃圧耐力 (プラントメーカー)
- ② 水素爆発対策手順書の作成 (プラントメーカー)
- ③ 格納容器、炉水の放射線強度の評価 (NISA/JNES)
- ④ 原子炉建屋内放射線強度マップの作成 (TEPCO)

4. 注意事項

4.1. 水素爆発の危険性の回避

炉心はスクラムしたが、炉心損傷により、水の放射線分解が加速し、解析結果によれば、現時点では、1号炉で1.2kg/h、2、3号炉で1.7kg/hの水素が発生していると推定される。また、海水中の溶存酸素の析出により、現在の格納容器内は、水素、酸素、水蒸気の3相となっていることが考えられる。このため、高温時は水蒸気分圧が高く、水素爆発の懸念は低くなるが、温度低下により水蒸気分圧が下がると、水素爆発の危険性が高くなる。

現在、1号炉の格納容器下部で300℃となっている。この状態で不用意にベントを行うと爆発を起こす懸念が生じるため、注意を要する。

上記のとおり、格納容器内に水素、酸素の占める割合が高い状況であることから、不活性ガスとして使用される窒素で置換することが必要である。

いずれにせよ、水素爆発対策手順書をあらかじめ作成し、関係者に周知させることが必須となる。

(1) サプレッションチェンバでの燃焼

サプレッションチェンバ内での水素燃焼リスクはあるため注意を要する。万一水素燃焼が発生し、サプレッションチェンバが破損しても原子炉建屋におけるプールスクラビングが期待できる。

(2) ドライウェルでの燃焼

ドライウェルベントを行っていることから回避されるものと考えられるが注意を要する。しかしながら、格納容器スプレイ等による上部からの雰囲気冷却すると酸素濃度が上昇し、燃焼のリスクが高まるためこうした冷却方法は行うべきではない。(水蒸気濃度が5%以下となると燃焼のリスクがある。)

(3) 建屋内での燃焼

建屋側壁が解放されていることから、リスクは低いものと考えられるが、注意を要する。

4.2. 水蒸気爆発のリスク

TMI 事故のときのように、圧力容器内に熔融プールが保持されていた場合、これがドライウェル中の海水へ流下し、水蒸気爆発を引き起こす可能性がある。

ただし、圧力容器下部鏡板内外には制御棒駆動や炉内計装配管などの構造物が多数存在することから、熔融した燃料は緩慢かつ分散した流下となることが考えられ、水蒸気爆発のリスクは低いものと考えられる。

4.3. 塩析出による冷却性阻害のリスク

沸騰による塩分濃縮により、塩分が析出し、炉心下部に析出すると冷却性を阻害する。

これまでの冷却履歴を考慮すると、崩壊熱を上回る注水を行っているので、炉内での濃縮は少ないものと考えられるが、この点は、注意を要する。

4.4. ベント作業における周辺への影響について

すべての交流電源がなくなり、放射性物質の放出を想定した解析のケースでは、敷地境界で、約 34mSv/hr となり、8.5km 離れた地点で、約 3mSv/hr となる

現状の事故と比較した場合、事故後 9 日間が経っていることにより、半減期の短い核種は急激に減衰している。また、圧力抑制室からの放出が断続的に行われ、揮発性の放射性物質はほとんど放出されている。

現状において、格納容器から放出されても、上記の $1/10$ 以下の敷地境界で約 3.4mSv/hr、8.5km 地点で約 0.3mSv/hr と考えられる。

上記の計算は、16 方位の内の最大値を拾っているもので、管理放出をするベントの場合、風向きを考えると、方位によっては、ほとんど影響がないと考えられる。(特に遠距離の場合)

From: OST01 HOC
Sent: Monday, April 25, 2011 7:48 AM
To: FOIA Response.hoc Resource
Subject: FW: FYI - HOMELAND SECURITY NEWSWIRE ARTICLE ON MASSIVE SEARCH IN JAPAN
Attachments: image001.jpg

From: Weber, Michael
Sent: Monday, April 25, 2011 7:32 AM
To: OST01 HOC
Cc: Merzke, Daniel; Virgilio, Martin; Brenner, Eliot; Hayden, Elizabeth; Doane, Margaret; Mamish, Nader
Subject: FYI - HOMELAND SECURITY NEWSWIRE ARTICLE ON MASSIVE SEARCH IN JAPAN

Japan launches massive search effort today

Published 25 April 2011

24,800 soldiers, accompanied by ninety helicopters, fifty boats, and 100 divers are being sent into the disaster area to search for and recover the thousands of bodies still lying on the ground or buried under debris; 14,300 are confirmed dead and that 14,000 are still missing but presumed dead; the naval component of the search operation will search the water up to twenty miles off shore; veterinarians will search for sick and dying animals; the Japanese government has announced a 4 trillion yen (\$48.9 billion; 29.6 billion Pounds) emergency budget for disaster relief; the government said it would cost as much as 25 trillion yen to rebuild the areas devastated in the disaster



Search and recovery operation to begin in earnest // Source: ibtimes.com

A month and a half after the devastating 11 March earthquake and tsunami, the Japanese government has today (Monday) launched a massive effort to recover the bodies of those who died in the disaster, and also to check on farm life in the stricken area.

- 24,800 soldiers, accompanied by ninety helicopters, fifty boats, and 100 divers are being sent into the disaster area to search for and recover the thousands of bodies still lying on the ground or buried under debris. AP [reports](#) that 14,300 are confirmed dead and that 14,000 are still missing but presumed dead. The naval component of the search operation will search the water up to twenty miles off shore. The

government advised that many of the bodies which will be found will be in different degrees of decomposition, making identification difficult.

- Veterinarians are being sent to check on the remaining cows, pigs, and chicken in the disaster areas. The government estimates that 3,000 cows, 130,000 pigs, and 680,000 chickens have died as a result of the initial earthquake and tsunami and subsequent lack of food. The government has not yet decided whether to euthanize those animals found alive.

In other developments, the BBC reports that the Japanese government has announced a 4 trillion yen (\$48.9 billion; £29.6billion) emergency budget for disaster relief, after March's earthquake and tsunami.

The budget will need parliamentary approval later this month, and could be implemented in May.

The government said it would cost as much as 25 trillion yen to rebuild the areas devastated in the disaster.

On the nuclear front, the situation is still not clear. Here is an update by *CleanEnergy*:

- Tokyo Electric Power company estimates it will take nine months completely to seal off radiation leaking out of the damaged reactors
- The Japanese government has doubled the allowable radiation limits for workers since the crisis began.
- The utility is struggling to deal with tens of thousands of tons of highly radioactive water in and around the stricken plants
- *CleanEnergy* says it will take from ten to thirty years to dismantle the damaged reactors

Mike

Michael Weber
Deputy Executive Director for Materials, Waste, Research,
State, Tribal, and Compliance Programs
U.S. Nuclear Regulatory Commission

301-415-1705
Mail Stop O16E15

From: Shaffer, Mark R <ShafferMr@state.gov>
Sent: Thursday, April 28, 2011 5:51 AM
To: LIA08 Hoc; LIA03 Hoc
Cc: Schwartzman, Jennifer
Subject: RE: USNRC Earthquake-Tsunami Update 042711 1200 EDT
Attachments: USNRC Earthquake-Tsunami Update 042711 Revision 1, 1200 EDT.PDF

?? What does "National Stand-Down" mean??

Japan has scheduled a national stand-down on Friday April 29th, and Tuesday through Thursday, May 3rd, 4th, and 5th 2011 inclusive

This email is UNCLASSIFIED.

From: LIA08 Hoc [mailto:LIA08.Hoc@nrc.gov]
Sent: Wednesday, April 27, 2011 5:50 PM
Subject: USNRC Earthquake-Tsunami Update 042711 1200 EDT

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

The next NRC Update will be distributed at 1200 EDT on Thursday, April 28, 2011

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

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

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United States Senate

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

WASHINGTON, DC 20510-6175

DEENA POIRIER, MAJORITY STAFF DIRECTOR
RUTH VAN MARK, MINORITY STAFF DIRECTOR

April 6, 2011

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

Dear Chairman Jaczko,

I appreciate your hard work on the nuclear accident at the Fukushima power plant, and your efforts to help the public understand its implications for the American nuclear power fleet. I do want to raise concerns about some aspects of your response, with the hope that you can resolve them fully and quickly.

My concerns stem from the confirmation in response to my staff's inquiries that the Nuclear Regulatory Commission has been operating in a state of emergency since the Tohoku Earthquake on March 11, 2011. In particular, I question whether:

- 1) You may not have followed law as it pertains to the delineation of emergency authority as provided in Reorganization Plan #1 of 1980 (PL 98-614); and
- 2) This action may have reduced the contributions of your experienced colleagues in monitoring the event and in decision-making.

Section 3 of the Reorganization Plan #1 states that the functions transferred to the Chairman are those pertaining to an emergency concerning a particular facility or materials licensed or regulated by the NRC. Your Congressional Affairs staff indicated that you invoked these powers when the NRC Operations Center entered "monitoring mode" at 9:46 AM on March 11th in reaction to the Tohoku Earthquake and resulting potential tsunami threat to U.S. plants. At this time, the crisis is unfolding in Japan and I am not aware that you issued any warnings to any U.S. licensee or regulated facility since March 11th. On the contrary, you have repeatedly stated publicly that U.S. nuclear plants are safe and indicated, as has the U.S. Environmental Protection Agency, that any radiation resulting from the Fukushima nuclear accident that reaches the U.S. will not be significant enough to impact public health. Given what has transpired, it would be helpful if you could provide the basis for your invocation of emergency authority.

Secondly, if your basis for invoking emergency authority was the potential threat of a tsunami affecting nuclear plants in California, that threat ceased on March 11th. Please provide your rationale for continuing to exercise emergency authority after March 11th and your

KICK-169

Chairman Gregory Jaczko
April 6, 2011
Page 2

expectations for when and under what conditions you anticipate returning the agency to non-emergency status.

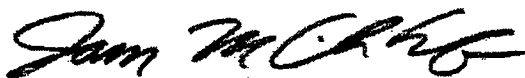
Section 3 of Reorganization Plan #1 also states that the functions transferred to the Chairman in an emergency include declaring, responding, issuing orders, etc., relative to the emergency incident. Since March 28th was the first indication my staff received regarding your exercise of emergency authority—and apparently no public declaration was made—I am concerned that any effort by you to declare an emergency has been less than ideal, especially given your commitment to openness and transparency.

Lastly, Section 3 of Reorganization Plan #1 states that the Chairman shall, to the maximum extent possible, inform the Commission of actions taken relative to the emergency. On March 30, my staff queried all four of your fellow commissioners regarding their knowledge of any such declaration. All four offices indicated that none of the commissioners received any communication from you declaring your intent to exercise emergency powers. It would be helpful if you could provide an explanation as to why the commissioners were apparently not informed of your action.

By April 8th, please provide the information requested above and any legal analysis prepared prior to March 30, 2011 that supports the transfer of functions from the Commission to you including the basis for continuing to exercise those powers.

I look forward to working with you as the NRC addresses the Japan nuclear accident, and to ensure the safety of the nation's nuclear fleet.

Sincerely,



James M. Inhofe
Ranking Member
Committee on Environment and Public Works

Cc: Commissioner Svinicki
Commissioner Apostolakis
Commissioner Magwood
Commissioner Ostendorff