From: Henderson, Pamela
Sent: Wednesday, March 23, 2011 3:30 PM
To: Rogge, John; Weerakkody, Sunil; Wilson, Peter
Cc: Rolph, Ronald; PMT03 Hoc; McNamara, Nancy
Subject: *I-131 identified offsite near Ginna*

FYI – Licensee developing a press release

From: Hunegs, Gordon
Sent: Wednesday, March 23, 2011 2:12 PM
To: Dentel, Glenn; Perry, Neil; Kolaczyk, Kenneth; Patel, Amar
Cc: Henderson, Pamela
Subject: I-131 identified offsite

Ginna analyzed a rainwater sample collected 9 miles west of the plant and identified 21 pci/l I-131. Ginna licensing manager anticipates that CENG corporate will be developing a press release which also will likely result in an NRC 50.72.

Gordon

000191

From: Henderson, Pamela
Sent: Wednesday, March 23, 2011 3:35 PM
To: Wilson, Peter; Weerakkody, Sunil
Cc: Rolph, Ronald; PMT03 Hoc
Subject: CENG will not issue press release... NEI instead?

NEI may be issuing a press release

From: Hunegs, Gordon
Sent: Wednesday, March 23, 2011 2:40 PM
To: Hunegs, Gordon; Dentel, Glenn; Perry, Neil; Kolaczyk, Kenneth; Patel, Amar
Cc: Henderson, Pamela
Subject: RE: I-131 identified offsite - update

CENG will not be developing a press release and instead, NEI will be representing the industry.

From: Hunegs, Gordon
Sent: Wednesday, March 23, 2011 2:12 PM
To: Dentel, Glenn; Perry, Neil; Kolaczyk, Kenneth; Patel, Amar
Cc: Henderson, Pamela
Subject: I-131 identified offsite

Ginna analyzed a rainwater sample collected 9 miles west of the plant and identified 21 pci/l I-131. Ginna licensing manager anticipates that CENG corporate will be developing a press release which also will likely result in an NRC 50.72.

Gordon

000192

From: PMT03 Hoc
Sent: Wednesday, March 23, 2011 10:12 AM
To: Henderson, Pamela
Subject: RE: Summary of Sample Results at Nine Mile Point and Ginna

I believe that if they report data to the HOO, that data will come to PMT for evaluation.

John

From: Henderson, Pamela
Sent: Wednesday, March 23, 2011 10:11 AM
To: PMT03 Hoc
Subject: RE: Summary of Sample Results at Nine Mile Point and Ginna

Rich Conaster says the licensees do not have to report on elevated levels it if it is not due to their licensed activities (see last e-mail from him that I forwarded). NRC needs to be prepared to review licensee's data to support that contamination is not due to their activities. Maybe the agency needs to consider asking plants to gather data on elevated levels of contamination on their sites that could be due to the incident.

It is important to have central data collection to ensure accurate communications.

From: PMT03 Hoc
Sent: Wednesday, March 23, 2011 10:06 AM
To: Henderson, Pamela
Subject: RE: Summary of Sample Results at Nine Mile Point and Ginna

I've been asking FSME and NRR to determine who gets the data. NRR tells me that the environmental data that exceeds the reporting levels first come into the Document Control desk and the NRR PM for the site. A copy also goes to DIRS in NRR for evaluation (if necessary). I see that you've already heard from Rich Conatser who is in that group. That's all I have so far. I'll let you know if/when I hear more.

John Wray
PMT Coordinator

From: Henderson, Pamela
Sent: Wednesday, March 23, 2011 9:25 AM
To: PMT03 Hoc
Subject: RE: Summary of Sample Results at Nine Mile Point and Ginna

John – we really need to know who in FSME is responsible. DNMS is getting lots of questions and reports too.

From: PMT03 Hoc
Sent: Wednesday, March 23, 2011 9:05 AM
To: Henderson, Pamela
Cc: Hoc, PMT12
Subject: RE: Summary of Sample Results at Nine Mile Point and Ginna

Thanks. I was asked to follow up with you. I'm glad that PMT 12 got the answer directly.

000193

John

From: Henderson, Pamela
Sent: Wednesday, March 23, 2011 9:02 AM
To: PMT03 Hoc
Subject: RE: Summary of Sample Results at Nine Mile Point and Ginna

John – I sent this to PMT12 this morning...

The licensee does not believe that the iodine resulted from licensed activities.
Nine Mile and Ginna are the only plants that have thus far reported elevated levels.
We have not coordinated with Region III, we were awaiting ET request for additional information before taking further action.

Who in FSME (MSSA?) is the contact for collection of radiation data in the US?

Thanks,

Pam

From: PMT03 Hoc
Sent: Wednesday, March 23, 2011 9:00 AM
To: Henderson, Pamela
Cc: Furia, Joseph; Rogge, John; Hoc, PMT12
Subject: Summary of Sample Results at Nine Mile Point and Ginna

Pam,

Yesterday, you sent an email regarding elevated environmental samples at NNP and Ginna. PMT would like more details, especially if isotopic data is available. Please provide as soon as possible. Thanks.

John Wray
PMT Coordinator

From: PMT03 Hoc
Sent: Wednesday, March 23, 2011 10:01 AM
To: Lee, Willie
Subject: RE: Summary of Sample Results at Nine Mile Point and Ginna

Thanks.

I searched some more and think the answer is in NRR. I'll be interested in seeing if Jim has any info regarding this question.

John

From: Lee, Willie
Sent: Wednesday, March 23, 2011 9:59 AM
To: PMT03 Hoc
Subject: RE: Summary of Sample Results at Nine Mile Point and Ginna

John,

I checked with Torre Taylor and Dennis Sollenberger (both senior HPs) with no luck. I have a 10 AM branch meeting but will also check with Jim Leuhman.

Willie

From: PMT03 Hoc
Sent: Wednesday, March 23, 2011 9:46 AM
To: Lee, Willie
Subject: FW: Summary of Sample Results at Nine Mile Point and Ginna

Willie,

This is the email I am trying to respond to. Thanks for any help.

John Wray

From: Henderson, Pamela
Sent: Wednesday, March 23, 2011 9:25 AM
To: PMT03 Hoc
Subject: RE: Summary of Sample Results at Nine Mile Point and Ginna

John – we really need to know who in FSME is responsible. DNMS is getting lots of questions and reports too.

From: PMT03 Hoc
Sent: Wednesday, March 23, 2011 9:05 AM
To: Henderson, Pamela
Cc: Hoc, PMT12
Subject: RE: Summary of Sample Results at Nine Mile Point and Ginna

Thanks. I was asked to follow up with you. I'm glad that PMT 12 got the answer directly.

000/94

John

From: Henderson, Pamela
Sent: Wednesday, March 23, 2011 9:02 AM
To: PMT03 Hoc
Subject: RE: Summary of Sample Results at Nine Mile Point and Ginna

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Thanks,

Pam

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To: Henderson, Pamela
Cc: Furia, Joseph; Rogge, John; Hoc, PMT12
Subject: Summary of Sample Results at Nine Mile Point and Ginna

Pam,

Yesterday, you sent an email regarding elevated environmental samples at NNP and Ginna. PMT would like more details, especially if isotopic data is available. Please provide as soon as possible. Thanks.

John Wray
PMT Coordinator

From: LIA10 Hoc
Sent: Wednesday, March 23, 2011 5:02 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: Nikkei Article regarding effect of radioactive materials
Attachments: image002.jpg; image003.gif; image004.png

Source: Nikkei 23:52, March 23 (Japan time)

Heading: The Nuclear Safety Commission of Japan released Prediction of Radioactive Materials Spread - certain amount could spread beyond evacuation boundary

The Nuclear Safety Commission (NSC) of Japan held a press conference in the evening on 23rd and released for the first time after the earthquake, the prediction regarding how extensively radioactive materials could spread when an accident occurred at nuclear power plant.

The cumulative dose of radiation caused by radioactive iodine will reach 100 milli- sievert during certain period of time outside of 30km radius evacuation area where the citizens are instructed to stay inside. 100 milli-sievert is the dose level set forth by the Nuclear Regulatory Commission for potassium iodide intake. Once the dose exceed this level, intake of potassium iodide is considered necessary in order to prevent radiation on public health.

Yukio Edano, Cabinet Secretary mentioned in the press conference on 23rd that 'It is a result of simulation when someone engages in activities outside for 24 hours. It might serve as one of the references but doesn' t warrant the immediate change of evacuation policy (within 30km)

NRC used the data collected using expedited radioactive effect prediction network at the time of emergency (SPEEDI) of the Nuclear

000195

Safety Technology Center of MEXT. Since the information of the amount of radiation actually released from Fukushima Dai-ichi as a result of the earthquake is unavailable, most severe conditions were used for this prediction. They estimated the dosage thyroid could be exposed if one year old infant who is most likely affected by radioactive iodine stayed outside all day during the period of March 12 to March 23.

Chairman Madarame emphasized during the press conference "if stayed inside, exposure will be reduced to ¼ to 1/10 . There is no need to immediately expand the evacuation boundary nor recommending the intake of potassium iodide. " Having said that, he warned "Just to be on the safe side, refrain from going outside when the wind is blowing from the power plant and it is recommended windows be closed if they are in downwind.

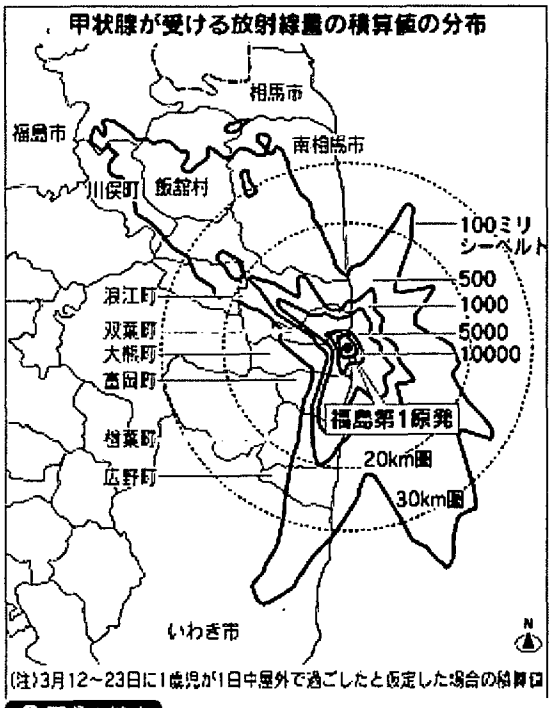
Some point out that the concern on public health is rather small because Japanese take iodine from seaweed and other food items so that accumulated iodine in thyroid would prevent radioactive iodine to be absorbed by thyroid.

放射性物質の拡散予測図を初公表　原子力安全委

退避圏外も一定量

2011/3/23 23:52

国の原子力安全委員会（班目春樹委員長）は23日夜に記者会見し、原子力発電所の事故発生時に放射性物質が広がる範囲の予測結果を地震後、初めて公表した。放射性ヨウ素による一定期間の積算放射線量が、屋内退避圏内の30キロメートルを超えて100ミリシーベルトになるという。100ミリシーベルトは原子力安全委が、健康被害を防ぐために予防薬の安定ヨウ素剤の服用が必要となる目安とした線量。



画像の拡大

枝野幸男官房長官は23日の記者会見で計算結果について「屋外で24時間活動した場合を前提としたシミュレーションだ。参考資料の一つにはなるが現時点でただちに（半径30キロ以内の退避範囲を）変更することにはならない」と述べた。

文部科学省系の原子力安全技術センターの緊急時迅速放射能影響予測ネットワークシステム（ＳＰＥＥＤＩ）を使った。福島第１原発の今回の事故で実際に放出されている放射線量は不明なため、もっとも厳しい条件を仮定。放射性ヨウ素の影響を受けやすいとされる１歳児が３月12～23日まで一日中屋外で過ごすことを想定し、甲状腺が受ける線量を推定した。

班目委員長は会見で、「屋内にいれば放射線の影響は屋外の４分の１～10分の１に減らせる。ただちに退避圏を拡大したり、安定ヨウ素剤を摂取したりすることは不要」と強調した。そのうえで、乳児を持つ保護者に対しては「あくまで念のためだが、発電所の方から風が吹くときは外出を控えてほしい。風下のときは窓を閉めて密閉した方がいい」と注意喚起した。

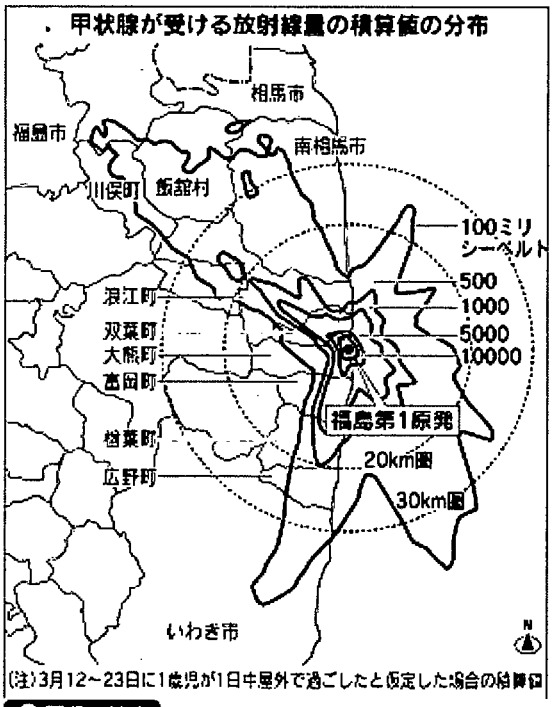
日本人は海藻などからヨウ素をとるので、それが甲状腺に蓄積され放射性ヨウ素を取り込みにくいため健康被害の懸念は小さいとの指摘もある。

放射性物質の拡散予測図を初公表　原子力安全委

退避圏外も一定量

2011/3/23 23:52

国の原子力安全委員会（班目春樹委員長）は23日夜に記者会見し、原子力発電所の事故発生時に放射性物質が広がる範囲の予測結果を地震後、初めて公表した。放射性ヨウ素による一定期間の積算放射線量が、屋内退避圏内の30キロメートルを超えて100ミリシーベルトになるという。100ミリシーベルトは原子力安全委が、健康被害を防ぐために予防薬の安定ヨウ素剤の服用が必要となる目安とした線量。



画像の拡大

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文部科学省系の原子力安全技術センターの緊急時迅速放射能影響予測ネットワークシステム（ＳＰＥＥＤＩ）を使った。福島第１原発の今回の事故で実際に放出されている放射線量は不明なため、もっとも厳しい条件を仮定。放射性ヨウ素の影響を受けやすいとされる１歳児が３月12～23日まで一日中屋外で過ごすことを想定し、甲状腺が受ける線量を推定した。

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From: LIA10 Hoc
Sent: Wednesday, March 23, 2011 2:32 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: Nikkei story: Unit 1 instruments start, Black smoke at Unit 3

Source: Nikkei news subscriber site

2011/3/23 19:56 (2011/3/23 23:25 更新)

Unit 1 instruments restart

Black smoke at Unit 3

Preparations were in place on the 23rd for energizing all four units of the Fukushima Daiichi NPS damaged in the Great East Japan Earthquake, for which urgent recovery efforts are underway. A portion of the instrumentation of Unit 1 restarted. Black smoke issued from Unit 3 the same evening, however. It was also discovered that radiation levels in Unit 2 are high. Amid repeated interruptions of recovery work and water discharge, concerns are emerging that work to restore cooling function may stall.

After black smoke arose, Tepco suspended work in Units 1 through 4, evacuating 11 workers. External power was restored to all six Fukushima Daiichi reactors by the night of the 22nd. On the 23rd, a portion of the instrumentation in the central control room adjacent to the Unit 1 reactor building began to function. Instruments displaying the status of borated water poured into the reactor also started. The cooling pump(s) of Unit 3 was inspected, and preparations were underway to pump water as soon as the 24th.

On the subject of the black smoke from Unit 3, Chief Cabinet Secretary Edano stated at a press conference on the 23rd (PM) that "it is too soon to state anything definitively as the causes are under investigation."

Unit 1 reactor temperature reached 400 degrees Celsius at 4am on March 23. Water supply was increased such that temperature fell to somewhat more than 330 degrees by 2pm, but it ought to have remained around 100 degrees Celsius had the normal cooling function worked in the wake of the earthquake. Insufficient cooling causes further degradation of fuel rods. Pressure within the containment vessel also doubled in a day, but NISA asserts this is "tolerable from the standpoint of design."

Two persons received high levels of radiation during repair work at the building housing (the) Unit 2 turbine(s). NISA reported exposure of 50 millisieverts per 5 minutes for one person and 60 msV/5min for the other. Hourly exposure would have been 600 to 720 msV, or more than the level at which white blood cells begin to decrease, 500 msV. There are concerns that fuel rods within the reactor(s) may be damaged. NISA states "the cause of the radiation is unknown."

QQQ/96

Discharge of water to spent fuel pools also continued on March 23. (A) fresh concrete pumper(s) was/were used to add water at Unit 4. The Tokyo Fire Department announced it had stopped discharging water on the 23rd (PM) to Unit 3, which had given off black smoke. It had initially been planned for the Yokohama FD to discharge water from 4:30pm to 6:30pm with support from the Tokyo FD. Firefighters on standby at the site were evacuated to J-Village (Naraha town, Fukushima prefecture), some 20km from Daiichi NPS.

福島原発１号機で計器再稼働　３号機では黒煙

東日本大震災で被災した東京電力の福島第１原子力発電所では23日、復旧を急ぐ１～４号機のすべてで電気を流す準備が整った。１号機では一部の計器が再稼働した。ただ３号機で同日夕に黒煙が発生。２号機も放射線量が高いことが分かった。復旧作業や放水の中断が相次ぎ、冷却機能を取り戻す作業が滞る懸念が出ている。

東京電力は黒煙が上がった後、１～４号機での作業をすべて中断し、11 人の作業員を避難させた福島第１原発では22日夜までに全６基で外部電源が回復。23日には１号機の原子炉建屋に隣接する中央制御室で一部の計器が動き始めた。原子炉へ注ぐホウ酸水の状況を表示する機器も起動した。３号機は冷却ポンプを点検し、24日中にも水を送る準備が進んでいた。

枝野幸男官房長官は23日午後の記者会見で、３号機の黒煙について「原因の検討、調査をしている。確定的なことを申し上げる段階にない」と述べた。

１号機では23日午前４時に原子炉の温度がセ氏400度になった。給水量を増やして午後２時には同330度強になったが、地震時に本来の冷却機能が働けば同100度前後にとどまったはずだった。十分に冷やさないと燃料棒の損傷が一段と進む。格納容器内の圧力も１日で２倍になったが「設計上は耐えられる」（原子力安全・保安院）という。

また２号機のタービンがある建屋で、復旧作業中の２人が高い放射線を受けた。保安院によると、18日午前10時半ごろにそれぞれ５分当たり50ミリシーベルト、60ミリシーベルトを浴びた。１時間当たりでは600～720ミリシーベルトで、白血球数が減り始める毎時500ミリシーベルトを超える炉内の燃料棒が傷んでいる恐れもある。保安院は「放射線の原因は不明」としている。

使用済み核燃料プールへの放水は23日も続いた。４号機は生コン圧送機で水を入れた。一方、東京消防庁は23日午後、黒煙が上った３号機への放水を中止したと発表した。当初は横浜市消防局が同庁の支援を受けて、同日午後４時半から同６時半まで放水する予定だった。同庁によると、現場に待機していた隊員は、第１原発から約 20 キロ離れた「Ｊヴィレッジ」（福島県楢葉町）に退避した

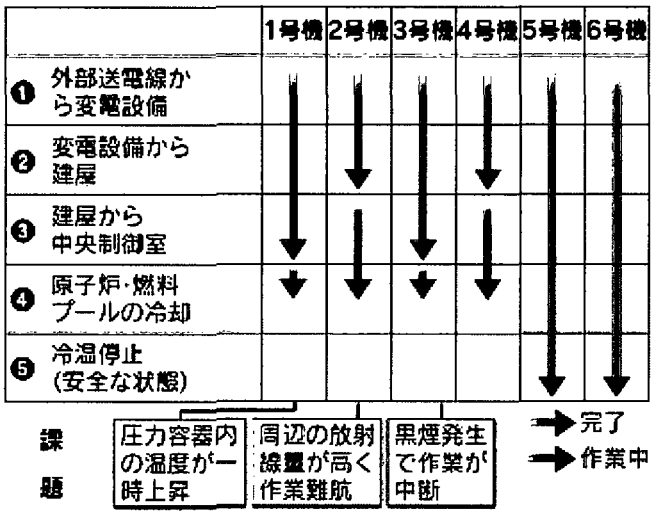
From: LIA10 Hoc
Sent: Wednesday, March 23, 2011 1:25 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: Nikkei article about Unit 5 pump(s)
Attachments: image001.png; image002.jpg; image008.gif

Source: Nihon Keizai Shimbun newspaper subscriber website

Fukushima Daiichi Unit 5 Cooling Pump(s) Stop(s) To Be Replaced

2011/3/24 0:37

福島第1原子力発電所の電源復旧作業状況



(1) From external transmission line to transformer equipment
(2) From transformer equipment to building
(3) From building to central control room
(4) Cooling of reactor / fuel pool
(5) Cold shutdown (safe state)

Green arrows: done
Blue arrows: work underway

Issues:
Unit 1 – temperature within pressure vessel temporarily increased
Unit 2 – difficult to work due to high radiation in surroundings
Unit 3 – work suspended due to black smoke

Tepco announced on the evening of the 23rd that the Fukushima Daiichi Unit 5 cooling pump(s) which use(s) seawater no longer function(s). It appears that a problem arose during work to switch from high-voltage mobile generator power to external power.

000/97

Unit 5 reactor water temperature is stable at less than 100 degrees Celsius, but there is a possibility that if no action is taken, the temperature could start to rise. Plans are to install (a) new pump(s) by daytime on the 24th and thus recover cooling function.

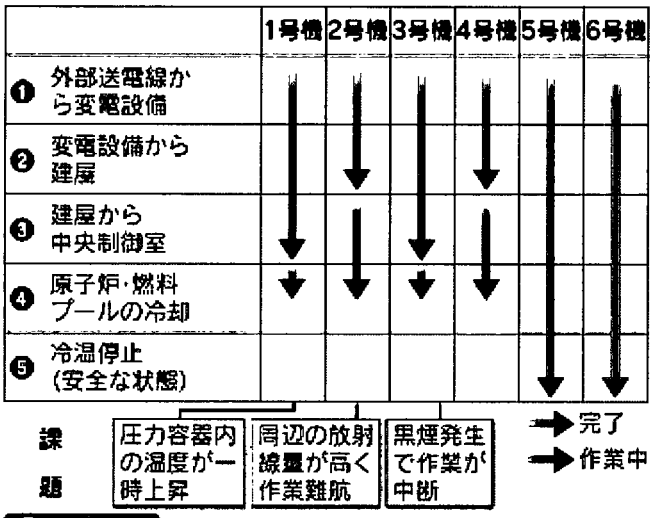
東京電力は23日夜、福島第１原子力発電所５号機で同日午後５時20分ごろ海水を使う冷却ポンプが動かなくなったと発表した。高圧電源車から外部電源に切り替える作業中に何らかのトラブルが発生したもようだ。

５号機は原子炉の水の温度がセ氏100度未満で安定しているが、現状のまま放置すると温度が上昇に転じる可能性がある。24日昼までに新しいポンプに取り換え冷却機能を回復させる予定。

５号機の冷却ポンプが停止、交換へ　福島第１原発

2011/3/24 0:37

福島第1原子力発電所の電源復旧作業状況



画像の拡大

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From: LIA02 Hoc
Sent: Wednesday, March 23, 2011 10:50 AM
To: Emche, Danielle; RST01 Hoc; PMT01 Hoc; LIA03 Hoc
Subject: RE: Update to Information Sheet Regarding the Tohoku Earthquake as of 10:00AM (EST), March 23, 2011

Thanks Danielle. Everyone here will be interested in hearing if they determine the source of the black smoke.

From: Emche, Danielle
Sent: Wednesday, March 23, 2011 10:49 AM
To: RST01 Hoc; PMT01 Hoc; LIA02 Hoc; LIA03 Hoc
Subject: FW: Update to Information Sheet Regarding the Tohoku Earthquake as of 10:00AM (EST), March 23, 2011

This is a recent update of TEPCO activities on March 23rd. Sources also include MEXT, MOD, and NISA. Please let me know if you have any questions about the sources or information.
Danielle

From: Tai Inada [mailto:Inada@denjiren.com]
Sent: Wednesday, March 23, 2011 10:45 AM
To: Tai Inada
Subject: Update to Information Sheet Regarding the Tohoku Earthquake as of 10:00AM (EST), March 23, 2011

Dear Friends,

Attached is the updated information regarding nuclear facilities for your information.

Best Regards,

Tai

QQQ/98

Attachment 0323_1900_Radiation_Monitoring.pdf(389385 bytes)
cannot be converted to PDF format.

Update to Information Sheet Regarding the Tohoku Earthquake

The Federation of Electric Power Companies of Japan (FEPC) Washington DC Office

As of 10:00AM (EST), March 23, 2011

- Radiation Levels
  - At 6:30PM (JST) on March 23, radiation level at main gate (approximately 3,281 feet from Unit 2 reactor building) of Fukushima Daiichi Nuclear Power Station: 249 micro Sv/hour.
  - Measurement results of environmental radioactivity level around Fukushima Nuclear Power Station announced at 7:00PM on March 23 are shown in the attached PDF file. English version is available at: http://www.mext.go.jp/english/radioactivity_level/detail/1303962.htm
  - For comparison, a human receives 2,400 micro Sv per year from natural radiation in the form of sunlight, radon, and other sources. One chest CT scan generates 6,900 micro Sv per scan.
- Fukushima Daiichi Unit 1 reactor
  - At 2:33AM on March 23, amount of seawater injection has increased by using water supply system in addition to water extinction system (from 2 cubic meter per hour to 18 cubic meter per hour).
  - At 2:00PM on March 23, pressure inside the reactor core: 0.376MPa.
  - At 2:00PM on March 23, water level inside the reactor core: 1.7 meters below the top of the fuel rods.
  - At 2:00PM on March 23, pressure inside the primary containment vessel: 0.345MPaabs.
  - As of 2:00PM on March 23, the injection of seawater into the reactor core continues.
  - As of 7:00PM on March 23, external power generation is connected through Unit 2 and the functionality of the electric devices is being checked.
- Fukushima Daiichi Unit 2 reactor
  - At 4:07PM on March 22, TEPCO began to inject seawater into the spent fuel storage pool, until 5:01PM (approximately 18 tons in total)
  - At 4:20AM on March 23, the temperature of the spent fuel pool: 123.8 degrees Fahrenheit.
  - At 2:00PM on March 23, pressure inside the reactor core: -0.036MPa.
  - At 2:00PM on March 23, water level inside the reactor core: 1.25 meters below the top of the fuel rods.
  - At 2:00PM on March 23, pressure inside the primary containment vessel: 0.11MPaabs.
  - As of 2:00PM on March 23, the injection of seawater into the reactor core continues.
  - As of 7:00PM on March 23, approximately 58 tons of water in total has been injected into the spent fuel storage pool.
  - As of 7:00PM on March 23, external power generation is connected and the functionality of the electric devices is being checked.
- Fukushima Daiichi Unit 3 reactor

- At 10:46PM on March 22, lighting was restored in the Central Control Room.
- At 9:10AM on March 23, pressure inside the reactor core: -0.104MPa.
- At 9:10AM on March 23, water level inside the reactor core: 1.8 meters below the top of the fuel rods.
- At 9:10AM on March 23, pressure inside the primary containment vessel: 0.1MPaabs.
- At 11:00AM on March 23, TEPCO began to inject water into the spent fuel pool, until 1:20PM (approximately 35 tons in total).
- At 4:20PM on March 23, black smoke was emitted from the secondary containment building. (Under investigation)
- As of 2:00PM on March 23, the injection of seawater into the reactor core continues.
- As of 7:00PM on March 23, approximately 3,927 tons of water in total has been shot to the spent fuel storage pool.

- Fukushima Daiichi Unit 4 reactor
  - At 5:17PM on March 22, TEPCO began to shoot water aimed at the spent fuel pool, until 8:32PM, with a specialized vehicle normally used for pumping concrete (approximately 150 tons in total).
  - At 10:00AM on March 23, TEPCO began to shoot water aimed at the spent fuel pool, until 1:02PM, with a specialized vehicle normally used for pumping concrete (approximately 130 tons in total).
  - As of 7:00PM on March 23, approximately 535 tons of water in total has been shot to the spent fuel storage pool.
  - As of 7:00PM on March 23, external power generation is connected and the functionality of the electric devices is being checked.
- Fukushima Daiichi Unit 5 reactor
  - At 7:41PM on March 22, it was confirmed that power supply was completely switched form diesel generator to external power.
  - At 2:00PM on March 23, the temperature of the spent fuel pool: 102.2 degrees Fahrenheit.
- Fukushima Daiichi Unit 6 reactor
  - At 7:41PM on March 22, it was confirmed that power supply was completely switched form diesel generator to external power.
  - At 2:00PM on March 23, the temperature of the spent fuel pool: 67.1 degrees Fahrenheit.

Our official sources are:

- Office of The Prime Minister of Japan
- Nuclear and Industrial Safety Agency (NISA)
- Tokyo Electric Power Company (TEPCO) Press Releases
- Ministry of Education, Culture, Sports, Science and Technology (MEXT)

No.24

Status of Fukushima Daiichi nuclear power station as of 12:00, March 23, 2011

Here is information regarding the status of Fukushima Daiichi nuclear power station from the news reports aired by NHK in this midnight and morning of March 23.

- Tokyo Fire Department will spray water to Unit-3 in this afternoon through cooperation with Osaka Fire Department. (11:10, March 23)
- The operation to inject water to the spent fuel pool of Unit-4 was started with special vehicle around 10:00. This vehicle has a long arm that enables to pour water to a target. (11:10, March 23)
- TEPCO will conduct test operation for pumps, which are to inject water into the reactor at unit-3. External AC power to the main control room of Unit-3 became available at 13:43 of March 22. (10:55, March 23)
- Nuclear and Industrial Safety Agency announced in its news briefing held around 10:00 AM on March 23 that the core temperature exceed design value of 302℃ and reached almost 400℃ at Unit-1. Core cooling function was enhanced through increasing number of injection lines, given this situation. (10:55, March 23)
- The work to recover external AC power for units-1, 2, 3 and 4 of Fukushima Daiichi nuclear power station is in progress. External AC power to the main control room of unit-3 became available at 13:43 of March 22. Now the lights are working in the room and working condition has been improved. Unit-3 is the first unit that external AC power became available among four units which are in severe condition. TEPCO will provide eternal AC power to systems for cooling the reactor and the suppression pool after checking availability of these systems at unit-3. Also the work to connect AC power line to distribution panels for Unit-1, 2 and 4 was accomplished. However, pumps of Unit-1 and 2 for cooling were covered by seawater and maintenance work is necessary for these pumps. (04:15, March 23)
- The Ministry of Education, Culture, Sports, Science and Technology will expand the area for monitoring radioactive nuclides in seawater to 30km, offshore, given the situation that seawater sample collected surrounding area contains radioactive nuclides in excess of the legal standards. (04:15, March 23)
- Most meters and gages have been unavailable in the power station since station blackout occurred after the earthquake. Meanwhile, temperature instrument to measure surface of the reactor of unit-1, 2, and 3 was restored and becomes available. (04:15, March 23)

End

From: LIA05 Hoc
Sent: Wednesday, March 23, 2011 9:36 AM
To: Dan Feighert; Andrew Seward; Harry Sherwood; John Simpson; Michelle Ralston; Steve Horwitz; Tim Greten; Vanessa E. Quinn
Subject: NRC SitRep 0700
Attachments: NRC Status Update 3.23.11--0700 EDT.pdf

Latest SitRep.

Larry and Odis

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

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000/99

From: Henderson, Pamela
Sent: Wednesday, March 23, 2011 9:02 AM
To: PMT03 Hoc
Subject: RE: Summary of Sample Results at Nine Mile Point and Ginna

John – I sent this to PMT12 this morning…

The licensee does not believe that the iodine resulted from licensed activities.
Nine Mile and Ginna are the only plants that have thus far reported elevated levels.
We have not coordinated with Region III, we were awaiting ET request for additional information before taking further action.

Who in FSME (MSSA?) is the contact for collection of radiation data in the US?

Thanks,

Pam

From: PMT03 Hoc
Sent: Wednesday, March 23, 2011 9:00 AM
To: Henderson, Pamela
Cc: Furia, Joseph; Rogge, John; Hoc, PMT12
Subject: Summary of Sample Results at Nine Mile Point and Ginna

Pam,

Yesterday, you sent an email regarding elevated environmental samples at NNP and Ginna. PMT would like more details, especially if isotopic data is available. Please provide as soon as possible. Thanks.

John Wray
PMT Coordinator

QQQ/102

From: OST02 HOC
Sent: Monday, April 04, 2011 2:07 PM
To: PMT03 Hoc
Cc: OST01 HOC; OST02 HOC
Subject: PMT Positions - Verify & Fill

Week of April 3-9

Please verify accuracy and fill any yellow highlights.

Thanks,
EST Admin Assistant
OST02

Protective Measures Team			
PMTR Director			
Sat-Sun	4/2-4/3	11pm - 7am	Christiana Lui
Sun	3-Apr	7am - 3pm	Cyndi Jones
Sun	3-Apr	3pm-11pm	Scott Flanders
Sun-Mon	4/3-4/4	11pm - 7am	John Lubinski
Mon	4-Apr	7am - 3pm	Cyndi Jones
Mon	4-Apr	3pm-11pm	Scott Flanders
Mon-Tue	4/4-4/5	11pm - 7am	John Lubinski
Tue	5-Apr	7am - 3pm	Cyndi Jones
Tue	5-Apr	3pm-11pm	Scott Flanders
Tue-Wed	4/5-4/6	11pm - 7am	John Lubinski
Wed	6-Apr	7am - 3pm	Cyndi Jones (Patricia Mulligan Noon-3pm)
Wed	6-Apr	3pm-11pm	Scott Flanders
Wed-Thur	4/6-4/7	11pm - 7am	John Lubinski
Thur	7-Apr	7am - 3pm	Trish Holahan
Thur	7-Apr	3pm-11pm	Don Cool
Thur-Fri	4/7-4/8	11pm - 7am	Kathy Gibson
Fri	8-Apr	7am - 3pm	Trish Holahan
Fri	8-Apr	3pm-11pm	Don Cool
Fri-Sat	4/8-4/9	11pm-7am	Kathy Gibson
Sat	9-Apr	7am - 3pm	Trish Holahan
Sat	9-Apr	3pm-11pm	Don Cool
Sat-Sun	4/9-4/10	11pm - 7am	Kathy Gibson
PMTR Coordinator			
Sat-Sun	4/2-4/3	11pm - 7am	Lou Brandon
Sun	3-Apr	7am - 3pm	Brian Harris

Sun	3-Apr	3pm-11pm	Nima Ashkeboussi
Sun-Mon	4/3-4/4	11pm - 7am	Lou Brandon
Mon	4-Apr	7am - 3pm	Arlon Costa
Mon	4-Apr	3pm-11pm	Nima Ashkeboussi
Mon-Tue	4/4-4/5	11pm - 7am	Lou Brandon
Tue	5-Apr	7am - 3pm	Duane Hardesty
Tue	5-Apr	3pm-11pm	Nima Ashkeboussi
Tue-Wed	4/5-4/6	11pm - 7am	Lou Brandon
Wed	6-Apr	7am - 3pm	Arlon Costa
Wed	6-Apr	3pm-11pm	Ryan Craffey
Wed-Thur	4/6-4/7	11pm - 7am	Kimyata MorganButler
Thur	7-Apr	7am - 3pm	Duane Hardesty
Thur	7-Apr	3pm-11pm	Nima Ashkeboussi
Thur-Fri	4/7-4/8	11pm - 7am	Lou Brandon
Fri	8-Apr	7am - 3pm	Arlon Costa
Fri	8-Apr	3pm-11pm	Ryan Craffey
Fri-Sat	4/8-4/9	11pm-7am	Lou Brandon
Sat	9-Apr	7am - 3pm	Duane Hardesty
Sat	9-Apr	3pm-11pm	Ryan Craffey
Sat-Sun	4/9-4/10	11pm - 7am	Kimyata MorganButler
PMTR Prot Actions Asst Dir			
Sat-Sun	4/2-4/3	11pm - 7am	Bruce Musico
Sun	3-Apr	7am - 3pm	Jessica Kratchman
Sun	3-Apr	3pm-11pm	Tim Harris
Sun-Mon	4/3-4/4	11pm - 7am	Greg Casto
Mon	4-Apr	7am - 3pm	Kathy Brock
Mon	4-Apr	3pm-11pm	Tim Harris
Mon-Tue	4/4-4/5	11pm - 7am	Greg Casto
Tue	5-Apr	7am - 3pm	Kathy Brock/Jessica Kratchman (1-3pm)
Tue	5-Apr	3pm-11pm	Tim Harris
Tue-Wed	4/5-4/6	11pm - 7am	Greg Casto
Wed	6-Apr	7am - 3pm	Kathy Brock
Wed	6-Apr	3pm-11pm	Sandra Wastler
Wed-Thur	4/6-4/7	11pm - 7am	Greg Casto
Thur	7-Apr	7am - 3pm	Kathy Brock
Thur	7-Apr	3pm-11pm	Tim Harris
Thur-Fri	4/7-4/8	11pm - 7am	Greg Casto
Fri	8-Apr	7am - 3pm	Kathy Brock (Bruce Musico from 11-1)
Fri	8-Apr	3pm-11pm	Sandra Wastler
Fri-Sat	4/8-4/9	11pm-7am	Jessica Kratchman
Sat	9-Apr	7am - 3pm	Stewart McGruder
Sat	9-Apr	3pm-11pm	Sandra Wastler

Sat-Sun	4/9-4/10	11pm - 7am	Jessica Kratchman
PMTR RAAD			
Sat-Sun	4/2-4/3	11pm - 7am	Mike Norris
Sun	3-Apr	7am - 3pm	Don Johnson
Sun	3-Apr	3pm-11pm	Duane Schmidt
Sun-Mon	4/3-4/4	11pm - 7am	Mike Norris
Mon	4-Apr	7am - 3pm	Cynthia Barr
Mon	4-Apr	3pm-11pm	Steve LaVie
Mon-Tue	4/4-4/5	11pm - 7am	Mike Norris
Tue	5-Apr	7am - 3pm	Duane Schmidt
Tue	5-Apr	3pm-11pm	Steve LaVie
Tue-Wed	4/5-4/6	11pm - 7am	Mike Norris
Wed	6-Apr	7am - 3pm	
Wed	6-Apr	3pm-11pm	Michelle Hart
Wed-Thur	4/6-4/7	11pm - 7am	Mike Norris
Thur	7-Apr	7am - 3pm	Duane Schmidt
Thur	7-Apr	3pm-11pm	Steve LaVie
Thur-Fri	4/7-4/8	11pm - 7am	Mike Norris
Fri	8-Apr	7am - 3pm	Cynthia Barr
Fri	8-Apr	3pm-11pm	Michelle Hart
Fri-Sat	4/8-4/9	11pm-7am	Leroy Hardin
Sat	9-Apr	7am - 3pm	
Sat	9-Apr	3pm-11pm	Michelle Hart
Sat-Sun	4/9-4/10	11pm - 7am	Mike Norris
PMTR Dose Assessment (RASCAL) - Need 2 people/day			
Sat-Sun	4/2-4/3	11pm - 7am	John Parillo/Fritz Sturz
Sun	3-Apr	7am - 3pm	Ed Roach/Tony Huffert
Sun	3-Apr	3pm-11pm	Casper Sun/Kimberly (Rapon) Gambone
Sun-Mon	4/3-4/4	11pm - 7am	John Parillo/**AJ Nosek** (called sick today)
Mon	4-Apr	7am - 3pm	Tony Huffert/Rich Clement/Anita Gray (in training)
Mon	4-Apr	3pm-11pm	Bernie White/Fritz Sturz
Mon-Tue	4/4-4/5	11pm - 7am	John Parillo/?
Tue	5-Apr	7am - 3pm	Tony Huffert/Rich Clement/John Tomon (in training)
Tue	5-Apr	3pm-11pm	Casper Sun/Fritz Sturz
Tue-Wed	4/5-4/6	11pm - 7am	AJ Nosek/Leroy Hardin
Wed	6-Apr	7am - 3pm	Tony Huffert/Rich Clement/Anita Gray (in training)
Wed	6-Apr	3pm-11pm	Casper Sun/Ron LaVera
Wed-Thur	4/6-4/7	11pm - 7am	Bernie White/AJ Nosek
Thur	7-Apr	7am - 3pm	Tony Huffert/Rich Clement
Thur	7-Apr	3pm-11pm	Casper Sun/Kimberly (Rapon) Gambone

Thur-Fri	4/7-4/8	11pm - 7am	Bernie White/Stephanie Bush-Goddard
Fri	8-Apr	7am - 3pm	Tony Huffert/Rich Clement
Fri	8-Apr	3pm-11pm	Casper Sun/Mohammad Saba
Fri-Sat	4/8-4/9	11pm-7am	Ron LaVera/Stephanie Bush-Goddard
Sat	9-Apr	7am - 3pm	Fritz Sturz/Mohammad Saba
Sat	9-Apr	3pm-11pm	Casper Sun/
Sat-Sun	4/9-4/10	11pm - 7am	Stephanie Bush-Goddard/Ed Roach

From: RST01 Hoc
Sent: Wednesday, March 23, 2011 1:14 PM
To: RST03 Hoc
Subject: FW: Pictures

From: ET07 Hoc
Sent: Wednesday, March 23, 2011 7:33 AM
To: RST01 Hoc
Subject: FW: Pictures

From: joe.lawson@nrc.gov [mailto:delivery@yousendit.com]
Sent: Wednesday, March 23, 2011 6:46 AM
To: ET07 Hoc
Subject: Pictures

joe.lawson@nrc.gov has sent you the following via YouSendIt

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QQQ/101

From: Schwartzman, Jennifer
Sent: Wednesday, March 23, 2011 5:08 PM
To: LIA03 Hoc; LIA02 Hoc
Subject: Re: computer problem

Lauren is Alison Rivera still at state liaison desk? If so can you tell me her LIA email address
Sent from an NRC Blackberry

From: LIA03 Hoc
To: Schwartzman, Jennifer; Abrams, Charlotte; Emche, Danielle
Sent: Wed Mar 23 16:34:30 2011
Subject: RE: computer problem

Wait it seems to be working again!!!

From: Schwartzman, Jennifer
Sent: Wednesday, March 23, 2011 4:33 PM
To: LIA03 Hoc; Abrams, Charlotte; Emche, Danielle
Subject: RE: computer problem

I'm on my way.

From: LIA03 Hoc
Sent: Wednesday, March 23, 2011 4:33 PM
To: Schwartzman, Jennifer; Abrams, Charlotte; Emche, Danielle
Subject: computer problem

The LIA02 computer is frozen. I am going to try shutting it down to see if that helps. But I will need someone to come and sign me in to all the necessary applications again.

Thanks!
Lauren

QQQ/102

From: Doane, Margaret
Sent: Wednesday, March 23, 2011 6:48 PM
To: Smith, Brooke; Foggie, Kirk
Cc: LIA02 Hoc; LIA03 Hoc
Subject: Misc.

Hello Brooke and Kirk,
I hope the two of you are continuing to stay safe, finding water and food and getting along ok.

Your dailies are very helpful. They are at the right level. I was very pleased to hear about the interactions with NISA and the successful TEPCO meeting.

Kirk, I think we need to handle the China request for help to Japan. I was going to recommend to the Chairman that we 1) tell NNSA that we will pass it on to NISA; 2) tell NNSA and NISA that we leave it up to them, but that we cannot put the Chinese on the American team because we are housed out of the US Embassy. We'd have more flexibility if it were simply an NRC effort; and 3) China is welcome to call the NRC Ops Center if they would like information on issues the NRC is examining – [Kirk, do you see any problem with that – we are talking to countries all over the world.] May need to use an embassy line to call NRC rather than on bb – if issues are sensitive.

Can you please tell me whether Mr. Hochevar from INPO has been in contact with you guys and if the Embassy is looking into how to use him, etc.

Finally, I've lost the thread on the IEC, IAEA issue. Hope nobody is waiting on me for further guidance.

Margie

000103

From: LIA10 Hoc
Sent: Thursday, March 24, 2011 3:04 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: Asahi article 2011/3/25 2:09

NISA: "Work was not done sufficiently" Workers Irradiated

2011年3月25日2時9分

2011/3/25 2:09

Three workers were irradiated March 24 while engaged in recovery work at Fukushima Daiichi NPS, two of which were taken to hospital. Tepco is not in a position to deny they may have been burned, since they got wet up to their ankles, exposing the skin of their feet-and-or-legs to radiation.

The two were sent to Fukushima Prefectural University Hospital (Fukushima city). They were "decontaminated" at a Self-Defense Force tent and in hospital, having radioactive materials removed from the outsides of their bodies and being examined by specialist physicians.

They did not have nausea or other symptoms of acute radiation sickness which occurs when large doses are received over the whole body, but the wet portions may have had some "local exposure," which occurs when large doses are received locally. This happens when entering into direct contact with radioactive

Tepco believes there is a possibility of "beta ray burn," with contaminants in water directly sticking to skin of feet-and-or-legs. Beta rays are a type of radiation.

According to Tepco, the radiation dosage at the same place on March 23 was a couple of mSv/hour, and there was little water on the floor. Therefore, work was begun on March 24 without measuring radiation. An alarm was in place to sound a warning whenever doses exceeded 20mSv/hour. It is unknown as to whether the alarm sounded. A co-worker was wearing boots and was not contaminated, but the two were wearing shoes that only went up to about the level of the ankles.

Nishiyama of NISA stated "working methods were not sufficient." He pointed out that special attention should be paid to water within the facility.

Tepco reports a total of 17 workers irradiated at levels greater than 100mSv.

保安院「作業のやり方十分ではなかった」　作業員被曝

東京電力福島第一原子力発電所で２４日、復旧作業中の作業員３人が被曝（ひばく）し、うち２人が病院に運ばれた。東電は、くるぶしまで水に漬かったために足の皮膚に放射線を浴び、やけどを負った可能性も否定できないとしている。

QQQ/104

２人は救急車で福島県立医大病院（福島市）に搬送された。自衛隊のテントや病院内で体の外側の放射性物質を取り除く「除染」を受け、専門医らの診察を受けた。

吐き気など、全身に大量被曝した際に起きる急性放射線障害の症状はないが、水に漬かった部分には、局所的に高線量の放射線を浴びる「局所被曝」が起きた可能性がある。これは放射性物質に直接触れた場合などに起こる。

東電は、水に浮いた汚染物質が足の皮膚に付着し、被曝による「ベータ線熱傷」が起きた可能性もあるとみる。ベータ線は放射線の一種。

島崎修次・日本スキンバンクネットワーク理事長（救急医学）は「表皮よりも深い部分まで傷つく熱傷で、場合によっては皮膚移植などの治療が必要になる可能性もある」と指摘する。

東電によると、２３日には同じ場所の放射線量は毎時数ミリシーベルトで、床の水も少なかったため、２４日は線量を測らずに作業を始めた。被曝線量が毎時２０ミリシーベルトを超えると警報音が鳴るアラームを着けていた。警報音が鳴ったかどうかは不明。一緒に作業していたもう１人は長靴をはいていて汚染がなかったが、２人はくるぶしくらいまでの短靴だった。

経済産業省原子力安全・保安院の西山英彦審議官は２４日の会見で、作業員が高線量の被曝をしたことを踏まえ、「作業のやり方は十分ではなかった」と述べ、特に施設内の水に注意が必要だと指摘した。

東電によると、福島第一原発の事故で被曝線量が１００ミリシーベルトを超えた作業員は累計１７人になった。

From: LIA10 Hoc
Sent: Thursday, March 24, 2011 2:30 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: Nikkei article 2011/3/25 0:48

Utsunomiya tap water radioactivity also exceeds infant standards

2011/3/25 0:48

Radioactive iodine was detected in tap water sampled on March 24 at the Tochigi Prefectural Health and Environment Center in Utsunomiya city at a level of 108 becquerels per kg, or greater than the provisional limit for infants of 100 becquerels per liter.

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。

宇都宮でも乳児の規制値超える放射性物質　水道水から

2011/3/25 0:48

栃木県は宇都宮市にある県保健環境センターの蛇口で 24 日に採取した水道水から、乳児向けの暫定規制値（１キログラムあたり 100 ベクレル）を上回る 108 ベクレルの放射性ヨウ素を検出したと発表した。

Q22 | 105

From: Henderson, Karen
Sent: Thursday, March 24, 2011 2:19 PM
To: LIA03 Hoc
Subject: RE: Talking points and Q & A

Thanks, Lance.

Cheers,

Karen

From: LIA03 Hoc
Sent: Thursday, March 24, 2011 1:51 PM
To: Henderson, Karen; Jones, Andrea; Schwartzman, Jennifer
Subject: Talking points and Q & A

Talking Points and Q & A as requested...

Lance

000106

From: LIA02 Hoc
Sent: Thursday, March 24, 2011 2:30 PM
To: LIA07 Hoc
Cc: LIA03 Hoc; LIA06 Hoc; LIA08 Hoc
Subject: InternationalActivities-3-24-2011.docx
Attachments: InternationalActivities-3-24-2011.docx

000107

- In an email from Mike Scott, he stated that "This afternoon I conveyed, through the PMT, a request from NISA for information on long-term decommissioning activities for damaged reactors. This is a broad request that will undoubtedly take some time to put together. If NRC could provide an initial response to support a Sunday meeting here with NISA, that would be helpful." In a response from the RST they stated that "This task was passed onto RES." This is also Task Tracker 2536.
- Received a call from French Embassy (Marie Campagne) asking for contact information for Frank Collins, Sr Emergency Response Coordinator.
- Contacted the State Department to get permission to give the US Ambassador to Japan the plume analysis so that he can give it to the Japanese. Was told to forward information to the taskforce1mailbox@state.gov and they will forward information. Was told that they are discussing this issue.
- Sent email to Mary Muessle about rehiring Bruce Mallet and got the following response: "We are engaging with Bruce, and so far, everything looks good on getting him on-board this week. I think Marty knows this so I am interested if I am missing something?"
- Verified for Mike Dudek at USAID that Danielle Emch and Eric Stahl were going to Japan as stated by Michelle Evans of ET.
- Called Kirk to have the US Ambassador to Japan call the Chairman on the role of the NRC.
- Working with FEMA Liaison on information related to US Policy for returning a population after evacuation due to a radiological event. Followup to sending NUREG 0728 to Brooke Smith for request for NISA.

From: LIA10 Hoc
Sent: Thursday, March 24, 2011 7:07 AM
To: LIA02 Hoc; LIA03 Hoc
Subject: NISA statement on Iwate earthquake

Impact of Earthquake on Nuclear Power Facilities (as of 17:50)

[2011/03/24 17:52 updated]

NISA announcement: impact of today's earthquake (approx. 17:21) off the Iwate coast, maximum intensity on the Japanese seismic scale a little less than 5, is as follows:

- Onagawa NPS has been shut down since the Tohoku Pacific Earthquake.
- NISA inspection personnel on site report no anomalies.
- NISA is endeavoring to grasp information.

地震による原子力施設への影響について（17 時 50 分現在）

[2011/03/24 17:52 更新]

原子力安全・保安院から、本日 17 時 21 分頃、岩手県沖（最大震度５弱）で発生した地震による原子力施設への影響についてお知らせします。

・女川原子力発電所は、東北地方太平洋沖地震後、運転を停止しています。
・現地サイト内の原子力保安検査官によれば、現在のところ、異常の報告はありません。
・原子力安全・保安院では、情報の把握に努めています。

0002/108

From: LIA02 Hoc
Sent: Thursday, March 24, 2011 8:18 AM
To: Emche, Danielle
Cc: LIA03 Hoc
Subject: RE: Control Dosimeter

It is in the desk drawer, please come and get it when you can.

Steve

From: Emche, Danielle
Sent: Thursday, March 24, 2011 8:17 AM
To: LIA02 Hoc
Subject: Re: Control Dosimeter

I will take it
Danielle
Sent from an NRC BlackBerry.

From: LIA02 Hoc
To: Stahl, Eric; Emche, Danielle
Sent: Thu Mar 24 04:44:49 2011
Subject: Control Dosimeter

Good morning - One of you has to take the *control dosimeter* with you when you leave for Japan. Whoever takes it has to talk to John O'Donnell for him to explain how it is used.

DRR / 109

From: PMT01 Hoc
Sent: Thursday, March 24, 2011 9:24 AM
To: PMT02 Hoc; PMT11 Hoc
Subject: FW: FYI - Time history of radiation readings from sensors
Attachments: Dose rate history.ppt

-----Original Message-----
From: Weber, Michael
Sent: Thursday, March 24, 2011 9:12 AM
To: PMT01 Hoc; LIA06 Hoc; LIA08 Hoc
Cc: ET07 Hoc; ET05 Hoc; OST02 HOC; FOIA Response.hoc Resource; RST01 Hoc
Subject: FYI - Time history of radiation readings from sensors

Radiation detector profiles through time last week in Tokyo. Appears to show multiple waves of contamination from the plants.

-----Original Message-----
From: Sheron, Brian
Sent: Thursday, March 24, 2011 8:06 AM
To: HOO Hoc
Cc: Weber, Michael
Subject: FW: Time history of radiation readings from sensors

Please forward to PMT Director.

-----Original Message-----
From: Per F. Peterson [mailto:peterson@nuc.berkeley.edu]
Sent: Wednesday, March 23, 2011 10:48 PM
To: Adams, Ian; Aoki, Steven; Binkley, Steve; Bob Budnitz; Sheron, Brian; Brinkman, Bill; Dick Garwin; Dick Garwin; Finck, Phillip; Grossenbacher, John (INL); Hurlbut, Brandon; Kelly, John E (NE); Koonin, Steven; McFarlane, Harold; Owens, Missy; Per Peterson; Rolando Szilard; Steve Fetter
Subject: Time history of radiation readings from sensors

The attached dose rate history figure from NEA is very helpful in seeing when significant releases occurred and what specific events at the plant the releases are linked to. But this plot only goes to March 17. Are there any that go out further in time?

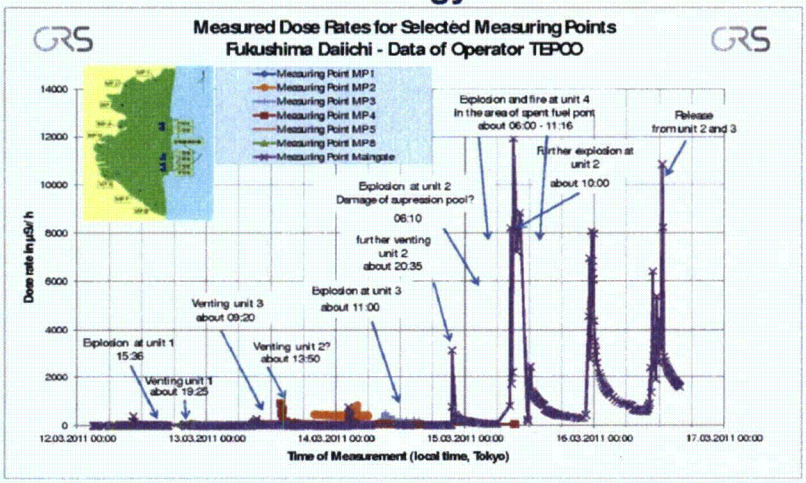
-Per
--

Per F. Peterson

QQQ / 110

Professor and Chair
Department of Nuclear Engineering
University of California
4153 Etcheverry Hall
Berkeley, California 94720-1730
peterson@nuc.berkeley.edu
Office: (510) 643-7749 Fax: (510) 643-9685
http://www.nuc.berkeley.edu/People/Per_Peterson

Radiation release chronology – Fukushima Dai-ichi



Source: OECD Nuclear Energy Agency

From: Batkin, Joshua
Sent: Thursday, March 24, 2011 7:52 AM
To: ET07 Hoc
Subject: Re: Call between Chairman and Amb. Roos

Got it - thanks Jane

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

From: ET07 Hoc
To: Batkin, Joshua
Sent: Thu Mar 24 07:44:56 2011
Subject: Call between Chairman and Amb. Roos

Josh:
Please let the Chairman know that the Ambassador will call him in about 30 minutes. He is currently in meetings and expects to be free then.

Thanks,
Jane Marshall
(ET Status Officer du jour)

QQQ/111

From: RMTPACTSU_ELNRC <RMTPACTSU_ELNRC@ofda.gov>
Sent: Thursday, March 24, 2011 8:57 AM
To: LIA01 Hoc; LIA02 Hoc; LIA07 Hoc; LIA08 Hoc; LIA12 Hoc; LIA04 Hoc; LIA11 Hoc; Harrington, Holly; McIntyre, David; Burnell, Scott; ET07 Hoc
Subject: FYI: Japan EQ and Tsunami Press Guidance - 03.24.11
Attachments: 110324 0830 EDT Japan EQ Talking Points.doc

Subject: Japan EQ and Tsunami Press Guidance - 03.24.11

Dear all,

Please find attached today's updated press guidance.

Best regards,

Helen Ho, Lily Frey, and Patricia Shea
Information Coordinators
Pacific Tsunami and Japan Earthquake Response Management Team
RMTPACTSU_INC@ofda.gov
202-712-0039

000/112

USG Talking Points
Humanitarian Response to Japan Quake
Updated 3/24/2011 @ 0830 EDT

The Government of Japan (GoJ) National Police Agency reported 9,737 deaths, 16,423 persons missing, and 2,777 people injured due to the earthquake and tsunami as of 0500 hours Eastern Daylight Time on March 24. The natural disasters also damaged or destroyed more than 139,000 buildings and 2,000 roads.

At present, U.S. agencies, including the U.S. Nuclear Regulatory Commission (NRC) and the U.S. Department of Energy (DoE), continue to report no increases in radiation levels in Tokyo. On March 24, nuclear specialists on the Disaster Assistance Response Team (DART) reported no major changes at the Fukushima Daiichi power plant, with the U.S. Government (USG) 50-mile zone for American citizens remaining in effect.

Approximately 10,000 USAID/OFDA-funded sets of personal protective equipment (PPE) arrived in Koriyama City in March 24—located on the edge of the contaminated zone in Fukushima Prefecture—for distribution to individuals working near the GoJ nuclear exclusion zone.

On March 24, DART staff participated in a joint assessment of affected areas in Miyagi Prefecture with the GoJ Ministry of Foreign Affairs, the GoJ Cabinet Secretary's Office, and the U.N. The DART reports that the GoJ continues to meet the immediate needs of individuals in affected areas, with sufficient relief items available locally and higher quantities of relief supplies flowing into affected areas as roads are repaired. DART staff note that coordination appeared strong at the local level and appears to be improving across the GoJ as telecommunications repairs are completed.

To date, the USG has provided more than $32.1 million in support of humanitarian assistance efforts in Japan.

Background

The U.S. Agency for International Development (USAID) is working with agencies across the U.S. Government—including the Nuclear Regulatory Commission and the Departments of State, Defense, and Energy—to provide necessary assistance to the Government of Japan following the earthquake and tsunami.

In coordination with the U.S. Embassy in Tokyo, the DART in Japan engages at three levels to determine potential humanitarian needs in Japan—nationally through Japan's Ministry of Foreign Affairs and other GoJ contacts, locally at the prefecture level and in coordination with U.S. Forces-Japan, and through Japanese civil society organizations.

Assessments from the U.S. disaster assistance response team in hard-hit Miyagi Prefecture indicate that assistance is flowing in an organized manner from the national level to the evacuation center level. The Japanese Government is responding robustly to humanitarian needs. The DART reports that sufficient relief commodities are available in-country and the GoJ has not requested in-kind contributions.

Nuclear specialists on the DART—including 11 NRC officers and 1 DoE officer—are monitoring technical aspects of the nuclear issues at the Fukushima Daiichi nuclear power plant, coordinating with Japanese Government officials to evaluate possible health impacts of radiation, and providing expert guidance to the U.S. Embassy in Tokyo and the GoJ on efforts to cool reactors.

USAID's urban search and rescue teams from Fairfax County, Virginia, and Los Angeles County, California—comprising 144 personnel and 12 live search canines—returned to the U.S. on March 19 and 20. The teams had completed all GoJ-assigned missions after nearly a week of operations in Iwate Prefecture, with no live rescues.

For individuals and businesses who wish to help those in Japan, we encourage making a cash donation to a reputable organization working in the affected area. Nothing will get there faster or help more at this time. Visit www.usaid.gov for more info or email japanhelp@ofda.gov.

From: RMTPACTSU_ELNRC <RMTPACTSU_ELNRC@ofda.gov>
Sent: Thursday, March 24, 2011 1:11 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: FYI: Travel Reservation March 29 for KIRK REYNARD FOGGIE

FYI

From: rmtpactsu_ac@ofda.gov [mailto:rmtpactsu_ac@ofda.gov]
Sent: Thursday, March 24, 2011 12:46 PM
To: Foggie, Kirk; RMTPACTSU_ELNRC; Johnson, Natalya
Subject: Travel Reservation March 29 for KIRK REYNARD FOGGIE

KIRK REYNARD FOGGIE has asked us to deliver their itinerary information to you. You can click here to view their travel information using Sabre® Virtually There®

QQQ | 113

From: Emche, Danielle
Sent: Thursday, March 24, 2011 7:42 PM
To: LIA03 Hoc
Subject: Re: Taiwan on daily PMT call

Ok thnx, maybe I will call in to listen
Danielle
Sent from an NRC BlackBerry.

From: LIA03 Hoc
To: Emche, Danielle
Sent: Thu Mar 24 19:36:58 2011
Subject: RE: Taiwan on daily PMT call

Danielle,
I wouldn't think the other countries would mind but you might know the answer to that better than I do. The call is at 14:00 through the Op Center (the main 301-816-5100) for the "Dose issues" or "International" bridge.

Thanks!
-Jenny

From: Emche, Danielle
Sent: Thursday, March 24, 2011 7:32 PM
To: LIA03 Hoc
Subject: Re: Taiwan on daily PMT call

Hi Jenny,
Do you think the other countries will mind? I never sat in on this call and don't know the tone. Can you provide the number and time?
About the question for the 50 mile radius, you could also forward your first stab to Elliot with Margie's input to work with Chairman. I thought it was good and the Chairman will say whatever he wants so it can't hurt.
Danielle
Sent from an NRC BlackBerry.

From: LIA03 Hoc
To: Emche, Danielle
Sent: Thu Mar 24 19:20:21 2011
Subject: Taiwan on daily PMT call

Danielle,
You should have gotten an email from the PMT room to provide the call-in info for the daily PMT call (with UK, France and Canada) to the correct contact(s) at AIT/TECRO. If you haven't received it, please let me know and I'll follow-up with them as appropriate.

Thanks!
-Jenny

QQQ/114

From: LIA02 Hoc
Sent: Thursday, March 24, 2011 9:40 AM
To: Casto, Chuck
Cc: LIA03 Hoc
Subject: RE: Question from ET about Cabinet meetings

Chuck,

Sorry to bother you but we are being asked the status of getting the meeting minutes.

Thank you,

Steve

From: LIA02 Hoc
Sent: Thursday, March 24, 2011 12:00 AM
To: Casto, Chuck
Cc: LIA03 Hoc
Subject: FW: Question from ET about Cabinet meetings

Hi Chuck – I don't know if Rick Devercelly has passed the two questions below to you. Could you please respond?

In your conversation with Charlie Miller yesterday you were recounting a successful meeting with the Cabinet. The ET subsequently had a conference call with the Consortium that's been set up between USG agencies and industry. The Cabinet Meeting came up on that call and two questions came out as a result:

1. Chuck mentioned that State Department was preparing minutes of the Cabinet Meeting. Can these be shared with industry? If not, is there another summary or some pared down information that can be shared?
2. Are any other countries' representatives participating in the Cabinet Meetings? Or is the U.S. the only guest that is currently attending? If other countries are participating, what is the level/affiliation of their participants?

Thanks.
Mugeh

From: Devercelly, Richard
Sent: Wednesday, March 23, 2011 1:54 PM
To: LIA02 Hoc
Subject: RE: Question from ET about Cabinet meetings

My apologies:

I do not know the answert to either question. I will make sure that Chuck is aware of them immediately upon his arrival in the morning.

Rick DeVercelly

From: LIA02 Hoc
Sent: Wednesday, March 23, 2011 1:36 PM
To: Devercelly, Richard

QQQ | 115

Cc: LIA03 Hoc
Subject: Question from ET about Cabinet meetings

Hi Rich,

I heard from the ET that you are taking the night shift tonight. I hope all is well over there.

Charlie Miller has a question he's hoping you might know the answer to without having to wake anyone up. In his conversation with Chuck earlier today, Chuck was recounting a successful meeting with the Cabinet. The ET subsequently had a conference call with the Consortium that's been set up between USG agencies and industry. The Cabinet Meeting came up on that call and two questions came out as a result:

1. Chuck mentioned that State Department was preparing minutes of the Cabinet Meeting. Can these be shared with industry? If not, is there another summary or some pared down information that can be shared?
2. Are any other countries' representatives participating in the Cabinet Meetings? Or is the U.S. the only guest that is currently attending? If other countries are participating, what is the level/affiliation of their participants?

Thank you in advance for your help with this. If you don't have the answers, just let us know and please ask Chuck when he wakes up.

Best regards,
Jen Schwartzman
NRC International Liaison Desk

From: LIA10 Hoc
Sent: Thursday, March 24, 2011 10:13 AM
To: LIA02 Hoc; LIA03 Hoc
Subject: NISA report 49

【Report 49】 Tohoku Pacific Earthquake NPS Impacts (As of 19:30, March 24)

[2011/03/24 22:01updated]

NISA informs as follows on impacts to nuclear power station facilities from the Tohoku Pacific Earthquake of approx. 14:46, March 11:

Changes from the last report are as follows:

1. Worker exposure to radiation
   There were 14 persons (all Tepco employees) who had been working at Fukushima Daiichi NPS and who suffered exposure in excess of 100mSv as of March 24 (AM). Further, at the Turbine Building of Unit 3 of Fukushima Daiichi NPS, three workers (all cooperating company employees) who had been laying cable received doses greater than 170mSv. Thus, 17 workers in all exceeded 100mSv.

2. Fukushima Daiichi NPS
   <Unit 3>
   Coolant Purification Line used to inject about 120t seawater to SFP (March 24, about 5:35 to about 16:05)
   <Unit 4>
   About 150t seawater discharged to SFP by concrete pump truck (50t/h) (March 24 14:36 to 17:30).
   <Unit 5>
   Temporary RHRS pump repair completed March 24 at 16:14. Cooling restarted March 24 at 16:35.\
   <Spent Fuel Common Pool>
   External power supplied March 24 at 15:37. Cooling started March 24 at 18:05. Pool water temperature was about 73 degrees at 18:40 on March 24.

000/116

【第 49 報】東北地方太平洋沖地震による原子力施設への影響について（24 日 19 時 30 分現在）

[2011/03/24 22:01 更新]

原子力安全・保安院から、3 月 11 日 14 時 46 分頃に発生した東北地方太平洋沖地震による原子力施設への影響についてお知らせします。

前回からの変更点は以下のとおり。

１．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、３月２４日午前の時点で、１４名（全員東電社員）であり、更に、本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）について、170mSv 以上の線量を確認しことから、あわせると 100mSv を超過した作業員は１７名となっている。

２．福島第一原子力発電所関係

＜３号機＞

・使用済燃料プールに冷却材浄化系を用いて海水約１２０ｔを注入（24 日 5:35 頃から 16:05 頃）

＜４号機＞

・使用済燃料プールにコンクリートポンプ車（５０ｔ／ｈ）を用いて海水を約１５０ｔ放水（24 日 14:36 から 17:30）。

＜５号機＞

・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）。

＜使用済燃料共用プール＞

・外部からの電源供給を開始（24 日 15:37）し、冷却を開始（24 日 18:05）。

・２４日１８：４０時点でのプール水温度は７３度程度

From: LIA10 Hoc
Sent: Thursday, March 24, 2011 9:38 AM
To: LIA02 Hoc; LIA03 Hoc
Subject: Nikkei article 2011/3/24 15:34
Attachments: image001.jpg

Three workers irradiated, two sent to hospital: Fukushima Daiichi

170 to 180 mSv Dose

2011/3/24 15:34

Tepco announced on March 24 that three workers from a cooperating company were irradiated at Fukushima Daiichi NPS Unit 3, having received doses of 170 to 180 mSv. Two were feared to have radiation burns on both legs and were sent to hospital.

The three were males in their 20s and 30s. They worked laying power cables in the first-level basement of the Unite 3 Turbine Building from 10am to 1pm on March 24. Readings of the dosimeters they were wearing showed a maximum 180.07 mSv upon their return from the work site.

It is thought that water with radioactive material accumulated in the work site floor. Two of the workers may have burned with beta rays in the legs and were moved by ambulance. It is planned to transfer them to the National Institute of Radiological Sciences, which specializes in treating radiation exposure.

On March 15, the Ministry of Health, Labor and Welfare increased the dosage limit at Fukushima Daiichi from 100mSv to 250mSv. Tepco had given instruction to suspend work at 20mSv and it is unknown as to why this limit was exceeded.

３号機で作業員３人被曝、２人を病院搬送　福島第１

放射線量 170～180 ミリシーベルト

2011/3/24 15:34

東京電力は 24 日、福島第１原子力発電所３号機で作業していた協力会社の作業員３人が被曝（ひばく）したと発表した。浴びた放射線量は 170～180 ミリシーベルト。このうち２人は両足の皮膚に放射線でやけどを負った疑いがあり、病院に搬送された。

aaa/117

作業員３人の被曝（ひばく）について発表する東京電力の武藤栄副社長（24 日夕）

３人は 20～30 歳代の男性。24 日午前 10 時から午後１時まで、３号機のタービン建屋地下１階で電源ケーブルを敷設する作業をした。現場から戻って身に付けていた放射線計測機を調べたところ、最大 180.07 ミリシーベルトを記録していた。

現場の足元に放射性物質を含む水がたまっていたとみられる。このうち２人は足にベータ線熱湯を負った可能性があり、救急車で搬送された。被曝治療を専門とする放射線医学総合研究所に移送される予定。

厚生労働省は 15 日、福島第１原発での放射線量の限度を 100 ミリシーベルトから 250 ミリシーベルトに引き上げている。東電は今回、20 ミリシーベルトで作業を中断するように指示していたが、なぜ値を超えたかは不明という。

From: LIA02 Hoc
Sent: Thursday, March 24, 2011 8:34 AM
To: Foggie, Kirk
Cc: LIA03 Hoc
Subject: RE: Ambassador Call to Chairman

Are they still talking.

Thank you.

Steve

From: Foggie, Kirk
Sent: Thursday, March 24, 2011 8:33 AM
To: LIA02 Hoc
Cc: LIA03 Hoc
Subject: Re: Ambassador Call to Chairman

It went through.
Sent from Blackberry.

From: LIA02 Hoc
To: Foggie, Kirk
Cc: LIA03 Hoc
Sent: Thu Mar 24 08:21:56 2011
Subject: Ambassador Call to Chairman

Kirk,

Please let me know if the call has gone thru again. Thank you.

Steve

QQQ/118

From: LIA10 Hoc
Sent: Thursday, March 24, 2011 8:40 AM
To: LIA02 Hoc; LIA03 Hoc
Subject: Nikkei article 2011/3/24 15:27
Attachments: image001.jpg; image002.gif

Fukushima Daiichi Cooling Function Recovery Delayed

Difficulty Injecting Fresh Water to Unit 3

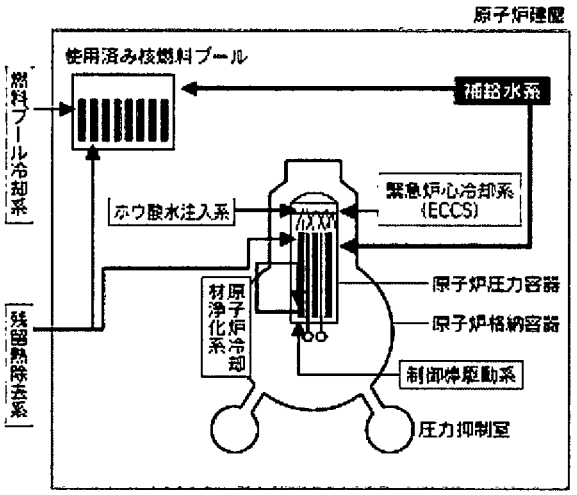
Temperature Control Concerns in Unit 1

2011/3/24 15:27

The situation at Fukushima Daiichi NPS remains unpredictable. Unit 1 reactor temperature rose for a time. When the amount of water injected was increased, containment vessel pressure increased. Experts believe part of the fuel may have melted. Black smoke rose the evening of March 23, causing a long suspension of work at Unit 3, where it had been planned to use external power and the "Replenishment Water System" to inject frewh water. Electricity is available at Units 1 through 4 but work to restore cooling functions is likely to be delayed.

Drawing of SFP and Core Cooling Systems

使用済み核燃料プールと炉心を冷やす仕組みのイメージ



Reactor building
SFP cooling system / SFP / "Replenishment Water System"
Borated Water Injection system / Emergency Core Cooling System
Residual Heat Removal System / Reactor Cooling-Cleaning System / Pressure Vessel / Containment Vessel / "Control Rod Drive System" / Pressure Control Chamber

Many experts point to danger in Unit 1, thought to have been most severely affected by the tsunami. Kinki Univ. professor Ito says "(Although water injections have continued since the earthquake) it is very likely that temperature control within the pressure vessel is not going well." There is a possibility that fuel rods are partly melted, losing their original shape.

002 / 119

On March 23, the upper and lower portions of the pressure vessel of Unit 1 reached 400 degrees Celsius for a time. This is more than 100 degrees greater than normal operating temperature, and far exceeds design temperature. Tokyo Industrial Univ. asst. professor Takahashi says "there is high probability that most of the water is gone and that large quantities of water vapor have accumulated."

Tepco and others increased water injection amount by 8 to 9 times and quickly lowered the temperature. It declined to about 230 degrees by the morning of March 24. When injecting seawater, though, the valve(s) allowing pressure to escape the pressure vessel was/were open. Water injection caused large amounts of water vapor to enter the containment vessel. The dilemma: pressure vessel temperature drops, but containment vessel pressure rises.

Energy Research Institute director Naito points out that "When the reactor is unstable, there is a limit as to what can be done by injection with fire pumps. It is indispensable to quickly begin operation of the original cooling function."

Li

Unit (Status at time of quake)	Bldg	SFP
1 (running)	× **Bad:** H explosion	unknown
2 (running)	Δ Medium: wall damage	Δ **Medium:** somewhat hi
3 (running)	× Bad: H explosion	Δ Medium: overheated?

4 (running)	× Bad: fire for a time	△ Medium: overheated?

(Note: Units 5 and 6 are in a stable “cold shutdown” state.)

福島原発、３号機ポンプ復旧急ぐ　作業員被曝で作業中断

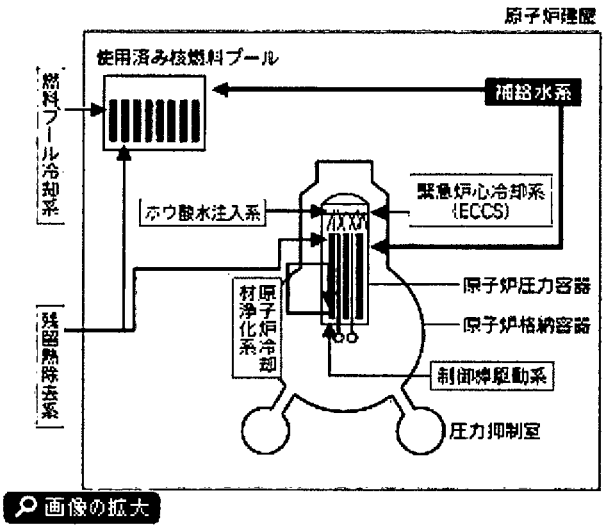
福島第１ 遅れる冷却機能復旧　３号機、真水注入が難航

１号機、温度抑制に不安

2011/3/24 15:27

東京電力の福島第１原子力発電所では予断を許さない状況が続いている。１号機の圧力容器の温度が一時、高くなり、注水量を増やしたため、今度は格納容器の圧力が上昇した。専門家は燃料の一部が溶けている可能性もあるとみている。外部電源を使った「補給水系」による真水の注水を計画していた３号機では23日夕に再び原因不明の黒煙が上がり、作業が長時間、中断した。１～４号機すべてが通電可能になったが、東日本大震災で失った冷却機能の本格的な回復は遅れそうだ。

使用済み核燃料プールと炉心を冷やす仕組みのイメージ



画像の拡大

地震時の津波による影響を最も受けたとされる１号機は、多くの専門家が危険な状態と指摘している。近畿大学原子力研究所の伊藤哲夫所長は「（地震後、海水注入を継続してきたが）圧力容器内の温度制御がうまくいっていない可能性が高い」と話す。燃料棒の一部が溶融し、原形をとどめていない公算もあるという。

１号機では23日、一時的に圧力容器の上部と下部でセ氏約400度まで温度が上昇した。通常の運転時の温度より100度以上高く、設計温度を大きく上回る。高橋実・東京工業大学准教授は「水がほとんどなくなって、水蒸気が大量にたまっている可能性が高い」という。

東電などは圧力容器内に注水する量を８～９倍に増やし、急速に温度を下げた。24日朝には230度前後まで下がった。ただ、海水注水時には圧力容器の圧力を逃がす弁は開いており、注水によって大量に発生した水蒸気は格納容器にどんどん出ている。圧力容器の温度は下がるが、格納容器の圧力が上がるというジレンマに陥る。

エネルギー総合工学研究所の内藤正則部長は「原子炉の状態が不安定な場合、消防ポンプによる注水の冷却では限度がある。原子炉本来の冷却機能を早く稼働させることが不可欠」と指摘する。

３号機は22日夜に中央制御室の照明が点灯し、本格的な復旧作業が進むと期待されていた。安定的な冷却に向けて原子炉に真水を入れて冷却するシステムである補給水系を復旧する計画だったが、23日夕の黒煙の発生で作業が中断し、遅れている。

補給水系は原子炉や使用済み核燃料プールを冷やすために備わっている冷却システムで、圧力抑制室の水などを出し入れするポンプを使い炉心に真水を入れる。

これまでは緊急手段として、非常用ポンプで海水を注入して冷却していた。ただ、海水は塩分を含んでおり、ポンプなどに悪影響を及ぼす恐れがある。今後、本格的な冷却機能の復旧を目指す上で、真水に切り替えなければならない。

福島第１原発の現状

号　機 （地震発生時の状況）	建　屋	使用済み核燃料プール	圧力容器	格納容器	通　電
１号機 （運転中）	× 水素爆発	不　明	燃料棒損傷。海水注入。一時、400度前後に温度上昇	○ 維　持	中央制御室まで。照明点灯
２号機 （運転中）	△ 壁に損傷	△ やや高め	燃料棒損傷か。海水注入	△ 圧力抑制室損傷か	建屋まで
３号機 （運転中）	× 水素爆発	△ 過熱か	燃料棒損傷か。	○ 維　持	中央制御室まで。照明点灯

			「補給水系」による真水注入目指す		
４号機（停止中）	× 一時火災	Δ 過熱か	燃料棒なし	○ 維持	建屋まで

（注）５、６号機は安定した「冷温停止」状態

From: Schwartzman, Jennifer
Sent: Thursday, March 24, 2011 12:53 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: Need email address for Warren Stern

Hi guys,

Can one of you please search the LIA03 computer for Warren Stern from DNDO and send me his email address? Thanks!

Jennifer Schwartzman Holzman
Office of International Programs
U.S. Nuclear Regulatory Commission
+1-301-415-2317
jennifer.schwartzman@nrc.gov

NOTE: Please note new email address above. My old email address, jks1@nrc.gov, will no longer work on this system. Please update your contact lists accordingly.*

000/120

From: Schwartzman, Jennifer
Sent: Thursday, March 24, 2011 4:21 PM
To: LIA03 Hoc
Subject: RE: Update from your call with Don Cool?

I'd leave it in one more shift with a note that the call took place and Jen is scheduling a followup and we can cut it out after that.

From: LIA03 Hoc
Sent: Thursday, March 24, 2011 4:20 PM
To: Schwartzman, Jennifer
Subject: RE: Update from your call with Don Cool?

Thanks Jen. Do we need to put the time for the followup call in the log? Or can I take the item out of the transition document? Preference? Thoughts?

Thanks!

From: Schwartzman, Jennifer
Sent: Thursday, March 24, 2011 4:09 PM
To: LIA03 Hoc
Subject: RE: Update from your call with Don Cool?

You can update it – they had a good conversation but another call is needed with someone from the RST. I'm working with NRR to set it up so I don't bother the people who are actually on duty.

From: LIA03 Hoc
Sent: Thursday, March 24, 2011 3:28 PM
To: Schwartzman, Jennifer
Subject: Update from your call with Don Cool?

Hey Jen1,
Any follow-up needed on the conversation between Mike (IAEA) and Don Cool? I just want to know if I can close the action/remove it from the next transition report.

Thanks!
-Jen2

000121

From: LIA10 Hoc
Sent: Thursday, March 24, 2011 12:22 AM
To: LIA09 Hoc
Subject: FW: references for interpreters

From: LIA10 Hoc
Sent: Wednesday, March 23, 2011 2:56 PM
To: LIA10 Hoc; LIA02 Hoc; LIA03 Hoc
Subject: references for interpreters

English press releases: http://www.nisa.meti.go.jp/english/index.html
http://www.tepco.co.jp/en/index-e.html

Japanese: http://www.meti.go.jp/press/index.html

http://www.tepco.co.jp/cc/press/index11-j.html

http://kinkyu.nisa.go.jp/

Nikkei: http://www.nikkei.com/ (requires subscription...Paul Hersey left it signed in as of 14:55 Wednesday)

Reference: http://www.rist.or.jp/atomica/

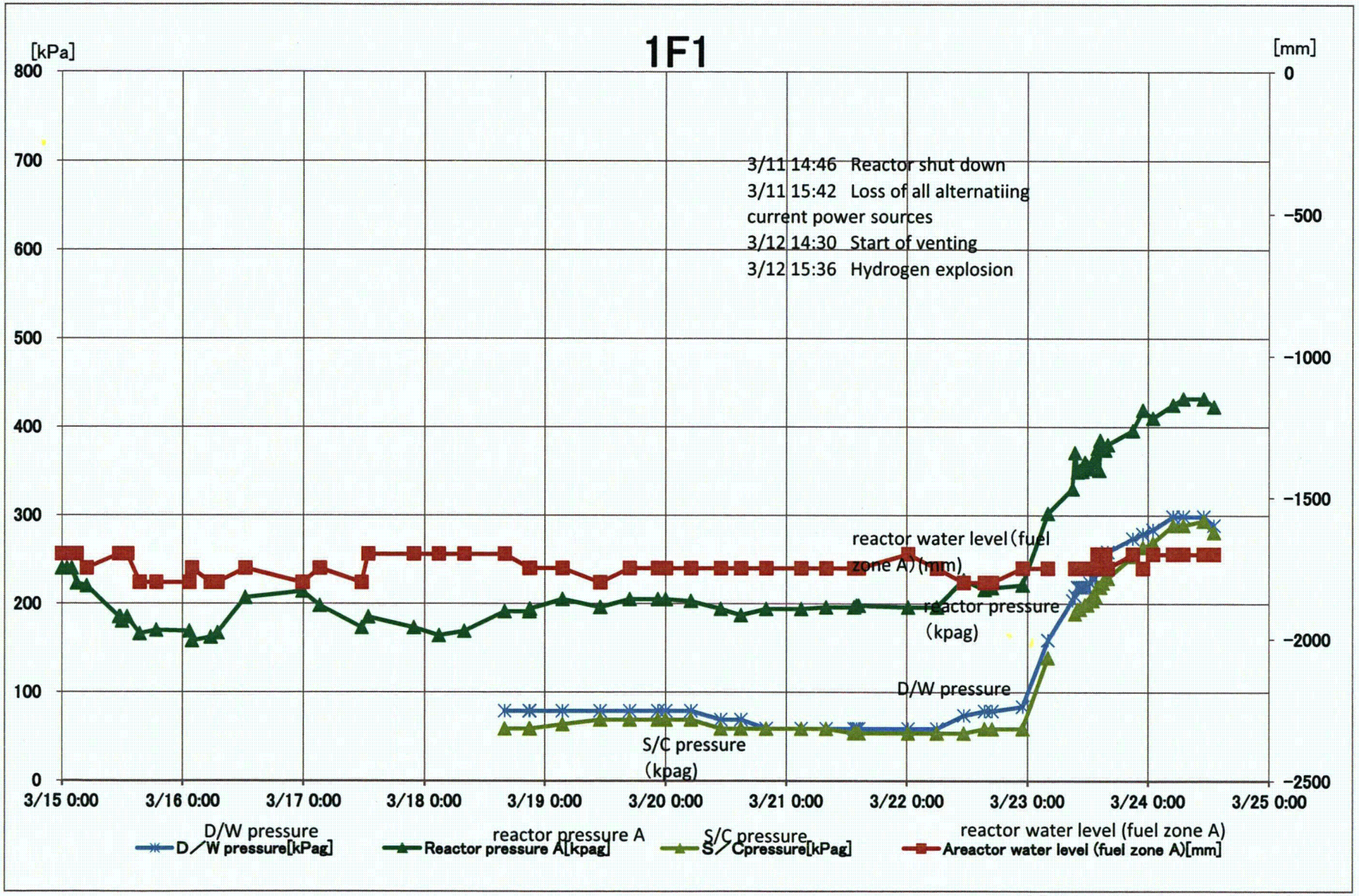
1. **INPO - Institute of Nuclear Power Operations**
2. 原子力発電運転協会（**INPO**）

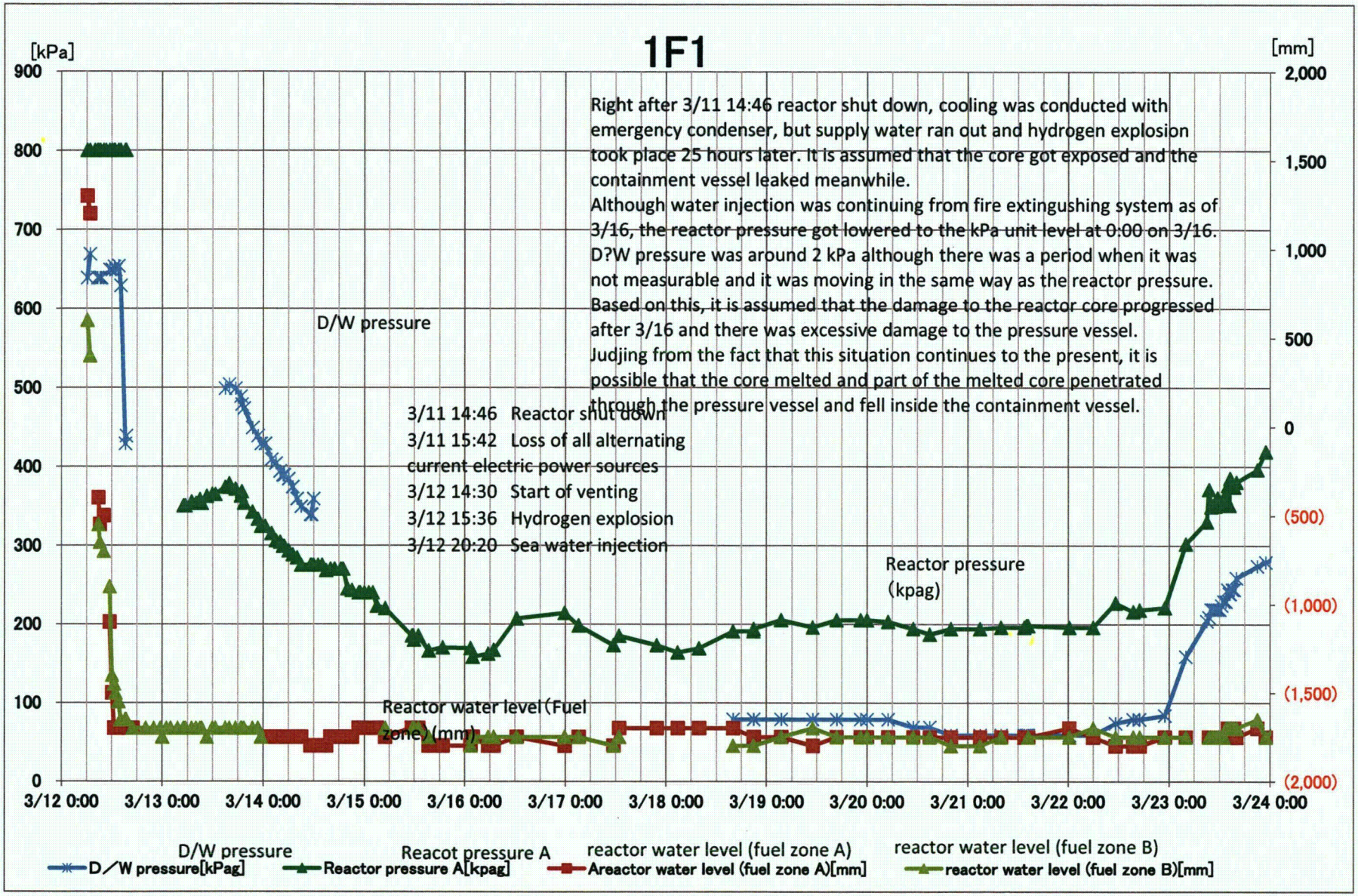
Q22/122

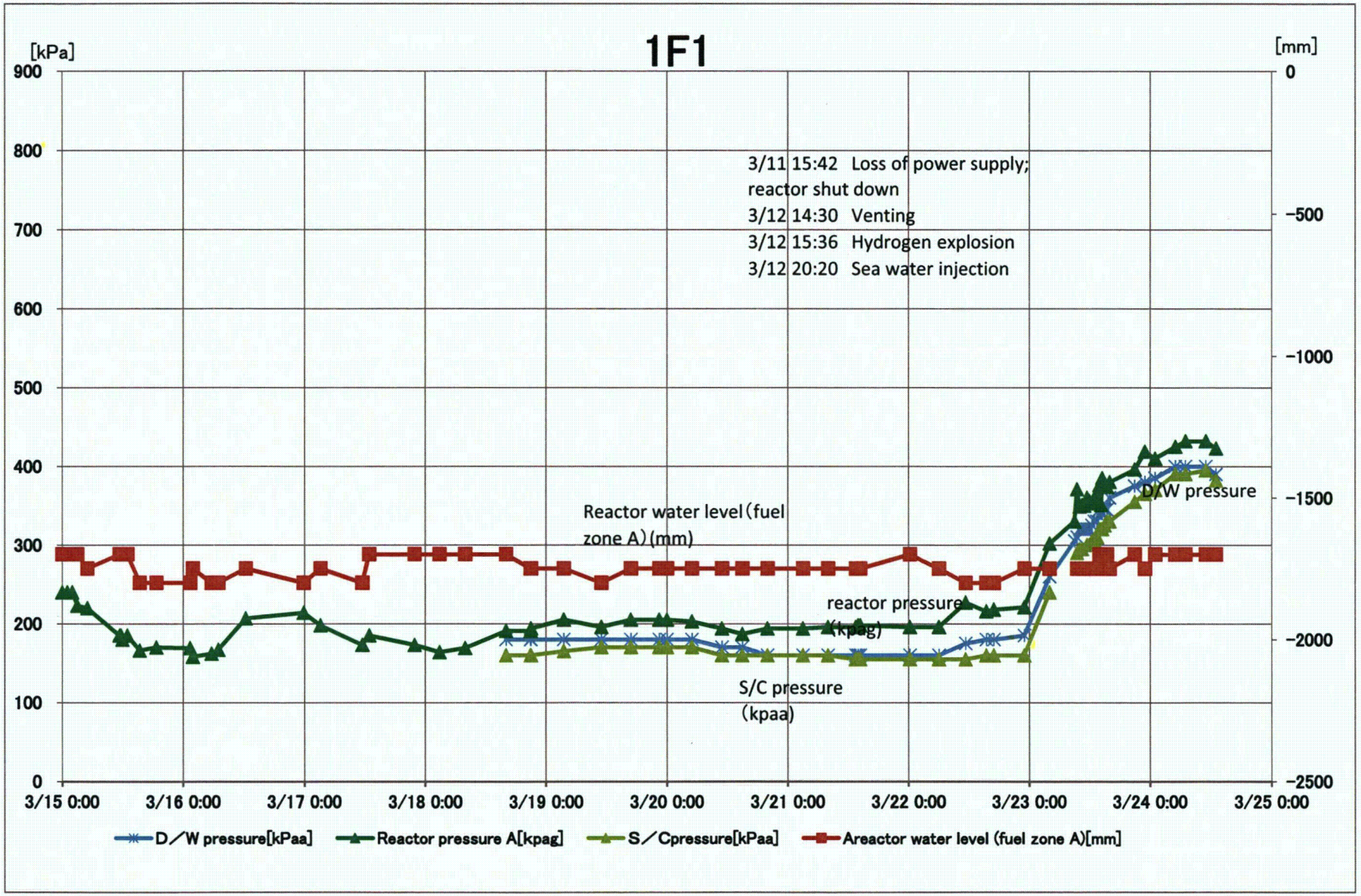
From: LIA02 Hoc
Sent: Thursday, March 24, 2011 10:55 PM
To: RST01 Hoc
Cc: LIA03 Hoc
Subject: Translation of headings
Attachments: ?F1Trend_110318-E.xls

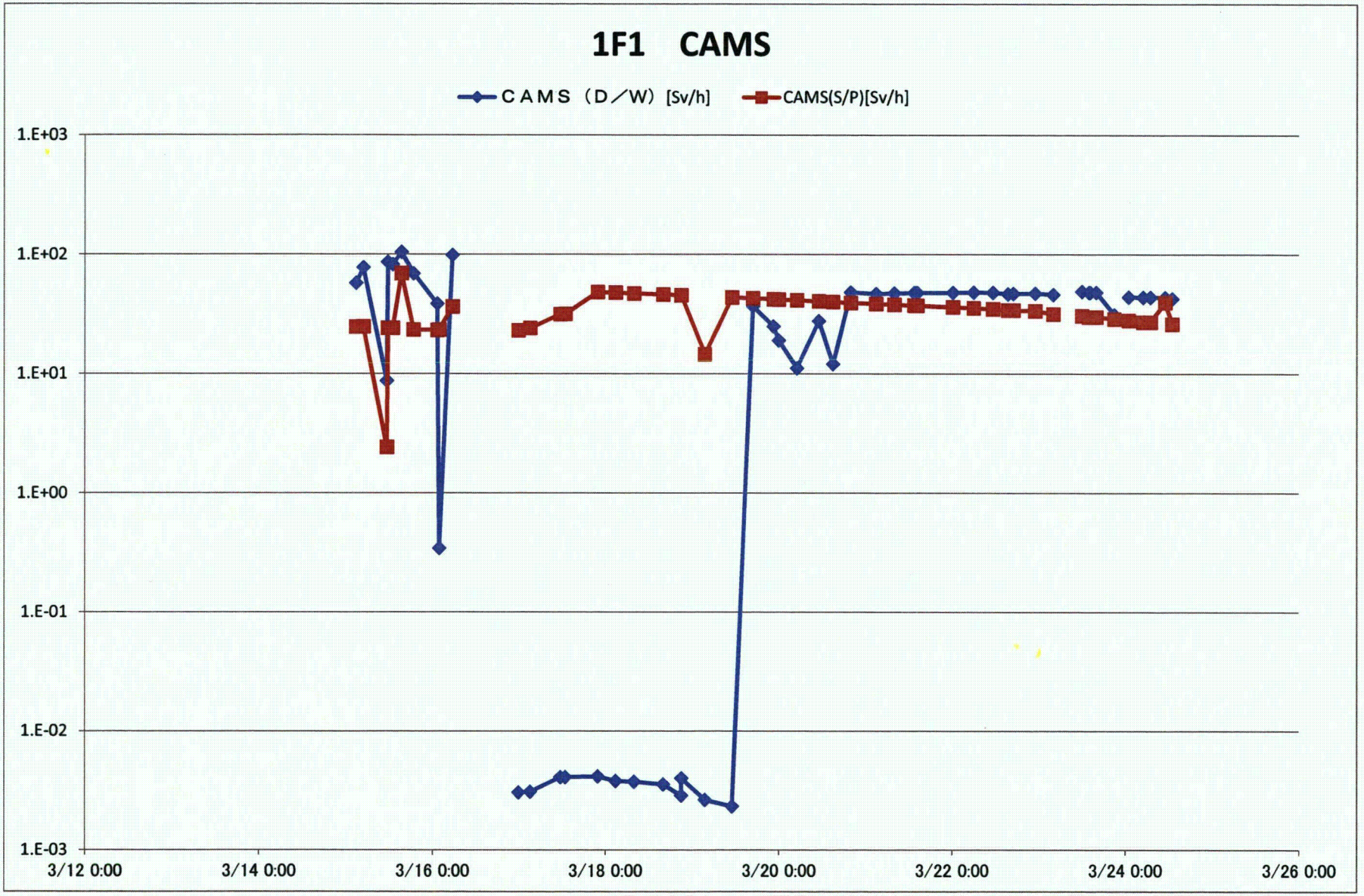
Bret,
Did you have a table that he was translating headings for?
Thanks!
-Jenny

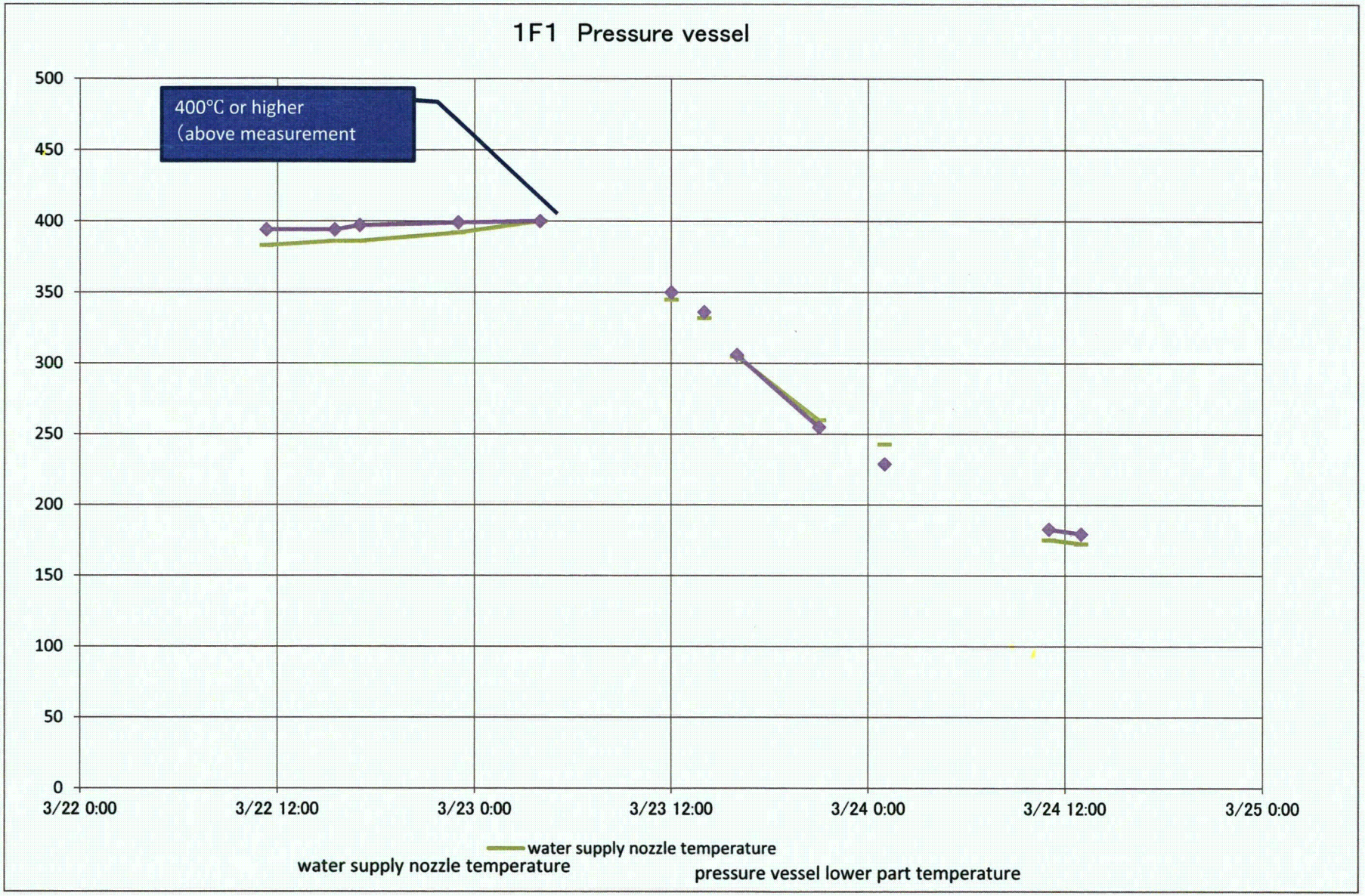
2002|123


1F1
[kPa]
[mm]
800
700
600
500
400
300
200
100
0
0
-500
-1000
-1500
-2000
-2500
3/11 14:46 Reactor shut down
3/11 15:42 Loss of all alternatiing current power sources
3/12 14:30 Start of venting
3/12 15:36 Hydrogen explosion
reactor water level (fuel zone A) (mm)
reactor pressure (kpag)
D/W pressure
S/C pressure (kpag)
3/15 0:00
3/16 0:00
3/17 0:00
3/18 0:00
3/19 0:00
3/20 0:00
3/21 0:00
3/22 0:00
3/23 0:00
3/24 0:00
3/25 0:00
D/W pressure
D／W pressure[kPag]
reactor pressure A
Reactor pressure A[kpag]
S/C pressure
S／Cpressure[kPag]
reactor water level (fuel zone A)
Areactor water level (fuel zone A)[mm]


1F1
[kPa]
[mm]
900
800
700
600
500
400
300
200
100
0
2,000
1,500
1,000
500
0
(500)
(1,000)
(1,500)
(2,000)
Right after 3/11 14:46 reactor shut down, cooling was conducted with emergency condenser, but supply water ran out and hydrogen explosion took place 25 hours later. It is assumed that the core got exposed and the containment vessel leaked meanwhile.
Although water injection was continuing from fire extingushing system as of 3/16, the reactor pressure got lowered to the kPa unit level at 0:00 on 3/16.
D?W pressure was around 2 kPa although there was a period when it was not measurable and it was moving in the same way as the reactor pressure.
Based on this, it is assumed that the damage to the reactor core progressed after 3/16 and there was excessive damage to the pressure vessel.
Judjing from the fact that this situation continues to the present, it is possible that the core melted and part of the melted core penetrated through the pressure vessel and fell inside the containment vessel.
D/W pressure
3/11 14:46 Reactor shut down
3/11 15:42 Loss of all alternating current electric power sources
3/12 14:30 Start of venting
3/12 15:36 Hydrogen explosion
3/12 20:20 Sea water injection
Reactor pressure (kpag)
Reactor water level (Fuel zone) (mm)
3/12 0:00
3/13 0:00
3/14 0:00
3/15 0:00
3/16 0:00
3/17 0:00
3/18 0:00
3/19 0:00
3/20 0:00
3/21 0:00
3/22 0:00
3/23 0:00
3/24 0:00
D/W pressure
D／W pressure[kPag]
Reacot pressure A
Reactor pressure A[kpag]
reactor water level (fuel zone A)
Areactor water level (fuel zone A)[mm]
reactor water level (fuel zone B)
reactor water level (fuel zone B)[mm]


1F1
[kPa]
[mm]
900
800
700
600
500
400
300
200
100
0
0
-500
-1000
-1500
-2000
-2500
3/11 15:42 Loss of power supply; reactor shut down
3/12 14:30 Venting
3/12 15:36 Hydrogen explosion
3/12 20:20 Sea water injection
Reactor water level (fuel zone A) (mm)
D/W pressure
reactor pressure (kpag)
S/C pressure (kpaa)
3/15 0:00
3/16 0:00
3/17 0:00
3/18 0:00
3/19 0:00
3/20 0:00
3/21 0:00
3/22 0:00
3/23 0:00
3/24 0:00
3/25 0:00
D／W pressure[kPaa]
Reactor pressure A[kpag]
S／Cpressure[kPaa]
Areactor water level (fuel zone A)[mm]


1F1 CAMS
CAMS（D／W）[Sv/h]
CAMS(S/P)[Sv/h]
1.E+03
1.E+02
1.E+01
1.E+00
1.E-01
1.E-02
1.E-03
3/12 0:00
3/14 0:00
3/16 0:00
3/18 0:00
3/20 0:00
3/22 0:00
3/24 0:00
3/26 0:00


1F1 Pressure vessel
400°C or higher
(above measurement
500
450
400
350
300
250
200
150
100
50
0
3/22 0:00
3/22 12:00
3/23 0:00
3/23 12:00
3/24 0:00
3/24 12:00
3/25 0:00
water supply nozzle temperature
water supply nozzle temperature
pressure vessel lower part temperature

Date		Reactor water level (fuel zone A)[mm]	reactor water level (fuel zone B)[mm]	Reactor pressure A)[kpag]	Reactor pressure B)[kpag]	D/W pressure [kPag]	D/W pressure [kPag]	S/Cpressure[kPag]	S/Cpressure[kPag]	CAMS(D/W)[Sv/h]	CA /P	ampers ture	part tampers ture	
[redacted]	6:10	1,300	600	600 0		740	639							
	6:47	1,200	400	600 0		770	669							
	7:55			600 0										
	8:38			800		740 0	639							
	8:49	(400)	-650	600 0										
	9:10	(550)	-650			740 0	639							
	9:15			600 0										
	9:30					740 0	639							
	10:04	-500	-700	600 0										
	10:40			600 0										
	11:30	-1,100	-900	600 0		750	649							
	12:05	-1,500	-1,400	600 0		750	649							
	12:35	-1,700	-1,450	600 0		754	653							
	12:45			600 0										
	12:55	-1,700	-1,500			750	649							
	13:38	-1,700	-1,550	600 0		750.0	654							
	14:10	-1,700	-1,650	600 0		730 0	629							
	15:14	-1,700	-1,550	600 0		530	429							
	15:28	-1,700	-1,650	600 0		540	439							
	17:00	-1,700	-1,700											
	20:08		-1,700											
	22:00		-1,700											
	23:35		-1,700											
3月13日	0:00		-1,750											
	1:00		-1,700											
	2:00		-1,700											
	3:38		-1,700											
	5:00		-1,700	350 00										
	5:30		-1,700	350 00										
	7:00		-1,700	355 000										
	8:00		-1,700	353 000										
	8:55		-1,700	356 000										
	9:25		-1,700	353 000										
	10:35		-1,750	352 000										
	11:55		-1,700	354 5000										
	12:40		-1,700	354 5000										
	15:00		-1,700	372 5000		800	499	600	499					
	16:00		-1,700	378 000		805	504	600	499					
	17:30		-1,700	371 3000		800	499	600	499					
	18:45		-1,700	382 3000		580	489	585	484					
	19:00		-1,700	387 8000		580	479	580	479					
	19:30		-1,700	353 3000		575	474	570	469					
	21:30		-1,700	342 000		550	449	550	449					
	22:45		-1,700	333 000		540	439	530	429					
	23:30		-1,750	324 000	50 000	530	429	530	429					
3月14日	0:30	-1750		324		530	429							
3月14日	2:00	-1750		315		510	409							
3月14日	3:00	-1750		306		505	404							
3月14日	4:00	-1750		304		495	394							
3月14日	4:40	-1750		299		490	389							
3月14日	5:00	-1750		299		490	389							
3月14日	6:00	-1750		293		485	384							
3月14日	7:00	-1750		288		475	374							
3月14日	8:00	-1750		284		460	359							
3月14日	9:00	-1750		275		450	349							
3月14日	11:15	-1800		275		440	339							
3月14日	11:25	-1800		275		440	339							
3月14日	11:30	-1800		275		440	339							
3月14日	12:00	-1800		275		460	359							
3月14日	13:00	-1800		275										
3月14日	14:00	-1800		275										
3月14日	15:00	-1800		268										
3月14日	16:00	-1750		270										
3月14日	17:00	-1750		270										
3月14日	18:30	-1750		270										
3月14日	19:00	-1750		270										
3月14日	20:03	-1750		245										
3月14日	21:04	-1750		243										
3月14日	22:40	-1700		240										
3月14日	23:00	-1700		240										
3月15日	0:00	-1700		240										
3月15日	1:00	-1700		240										
3月15日	2:00	-1700		240										
3月15日	3:00	-1700		223						5.73E+01	2.46E+01			
3月15日	5:00	-1750	-1700	220	59					7.74E+01	2.47E+01			
3月15日	11:25	-1700		185	70					8.70E+00	2.42E+00			
3月15日	11:42	-1700	-1700	185	72					8.58E+01	2.41E+01			
3月15日	11:58	-1700	-1700	180	72					8.44E+01	2.41E+01			
3月15日	13:00	-1700	-1700	185	68					8.19E+01	2.41E+01			
3月15日	15:25	-1800	-1750	168	70					1.04E+02	6.92E+01			
3月15日	18:43	-1800		170						6.89E+01	2.33E+01			
3月16日	1:24	-1800	-1800	169						3.84E+01	2.31E+01			
3月16日	1:54	-1750	-1750	158						3.44E+01	2.33E+01			
3月16日	5:35	-1800	-1750	162						9.81E+01	3.64E+01			
3月16日	6:55	-1800	-1750	167										
3月16日	12:25	-1750	-1750	207	171									
3月16日	23:50	-1800	-1750	214	169					3.05E-03	2.29E+01			
3月17日	3:10	-1750	-1750	198	155					3.09E-03	2.40E+01			
3月17日	11:30	-1800	-1800	173	144					4.10E-03	3.15E+01			
3月17日	12:50	-1700	-1750	185	144					4.10E-03	3.18E+01			
3月17日	21:50	-1700		172	151					4.15E-03	4.81E+01			
3月18日	2:50	-1700		184	142					3.60E-03	4.77E+01			
3月18日	7:55	-1700		168	146					3.75E-03	4.59E+01			
3月18日	18:00	-1700	-1800	191	153	180	79	160	59	3.56E-03	4.80E+01			
3月18日	20:55	-1750	-1800	191	146	180	79	160	59	2.87E-03	4.54E+01			
3月18日	21:00	-1750	-1800	194	151	180	79	160	59	4.00E-03	4.53E+01			
3月19日	3:30	-1750	-1750	205	155	180	79	165	64	2.83E-03	1.45E+01			
3月19日	11:00	-1800	-1700	196	151	180	79	170	69	2.32E-03	4.35E+01			
3月19日	16:50	-1750	-1750	205	160	180	79	170	69	3.87E+01	4.29E+01			
3月19日	22:30	-1750	-1750	205	164	180	79	170	69	2.49E+01	4.21E+01			
3月20日	0:00	-1750	-1750	205	167	180	79	170	69	1.89E+01	4.19E+01			
3月20日	5:00	-1750	-1750	203	162	180	79	170	69	1.11E+01	4.12E+01			
3月20日	11:00	-1750	-1750	194	160	170	69	160	59	2.76E+01	4.05E+01			
3月20日	15:00	-1750	-1750	187	158	170	69	160	59	1.20E+01	4.00E+01			
3月20日	20:00	-1750	-1800	194	160	160	59	160	59	48	39.1			
3月21日	3:00	-1750	-1800	194	158	160	59	160	59	4.88E+01	3.85E+01			
3月21日	8:00	-1750	-1750	196	164	160	59	160	59	4.71E+01	3.79E+01			
3月21日	13:30	-1750		196		160	59	155	54	47.5	37.4			
3月21日	14:00	-1750		196		160	59	155	54	47.8	37.3			
3月21日	14:25	-1750	-1750	196	171	160	59	155	54	47.6	37.3			
3月22日	0:15	-1700	-1750	196	171	160	59	155	54	47.7	36.2			
3月22日	8:00	-1750	-1700	196	187	160	59	155	54	48	35.5			
3月22日	11:20	-1800	-1750	227	205	175	74	155	54	47.8	34.9	383	394	
3月22日	15:30	-1800	-1750	216	169	180	79	160	59	4.65E+01	3.40E+01	388	394	
3月22日	17:00	-1800	-1750	218	191	180	79	160	59	48.8	34	396	397	
3月22日	23:00	-1750	-1750	221	196	185	83.7	160	58.7	47.1	33.6	392	399	
3月23日	4:00	-1750	-1750	302	270	260	158.7	240	138.7	48	31.6	400	400	温度OS
3月23日	9:00			330		305	203.7							
3月23日	9:30	-1750	-1750	371	331	310	208.7	290	188.7					
3月23日	10:00	-1750	-1750	349	322	320	218.7	295	193.7					
3月23日	10:30	-1750	-1750	351	322	320	218.7	295	193.7					
3月23日	11:00	-1750	-1750	350		320	218.7							
3月23日	11:30	-1750	-1750	350	329	320	218.7	300	198.7					
3月23日	12:00	-1750	-1750	356	320	320	218.7	300	198.7	48.8	30.6	345	350	
3月23日	12:30	-1750	-1750	353	328	325	223.7	305	203.7					
3月23日	13:00	-1750	-1750	360	329	330	228.7	305	203.7					
3月23日	13:30	-1750	-1700	380	333	330	228.7	310	208.7					
3月23日	14:00	-1700	-1700	378	358	345	243.7	320	218.7	48	29.8	332	338	
3月23日	14:20	-1700	-1700	351	378	340	238.7	320	218.7	48	29.9			
3月23日	14:30	-1700	-1700	385	351	340	238.7	320	218.7					
3月23日	15:00	-1700	-1700	374	342	345	243.7	325	223.7					
3月23日	15:30	-1700	-1700	374	34	345	243.7	330	228.7					
3月23日	18:00	-1750	-1700	380	358	360	258.7	330	228.7	48	29.9	305	306	
3月23日	21:00	-1700	-1650	398	374	375	273.7	355	253.7	3.12E+01	2.88E+01	280	255	
	23:00	-1750	-1750	419	396	380	278.7	385	283.7					
3月24日	1:00	-1700	-1700	410	387	385	283.7	370	268.7	43.9	27.9	243	229	
3月24日	5:00	-1700	-1700	425	401	400	298.7	390	288.7	43.7	27.1			
3月24日	7:00	-1700	-1700	432	405	400	298.7	390	288.7	43.7	27.1			
3月24日	11:00	-1700	-1700	432	401	400	298.7	395	293.7	43.5	39.5	175.3	182.8	
3月24日	13:00	-1700	-1650	423	387	390	288.7	382	280.7	42.4	28.1	172.6	179.5	

From: Batkin, Joshua
Sent: Thursday, March 24, 2011 8:00 AM
To: ET07 Hoc
Subject: Re: Call between Chairman and Amb. Roos

Ok thanks

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

From: ET07 Hoc
To: Batkin, Joshua
Sent: Thu Mar 24 07:56:51 2011
Subject: RE: Call between Chairman and Amb. Roos

I believe the Ambassador will call the Chairman directly (that's the word I got from the Liaison Team) on his home phone.

From: Batkin, Joshua
Sent: Thursday, March 24, 2011 7:55 AM
To: ET07 Hoc
Subject: Re: Call between Chairman and Amb. Roos

Jane - please have the Hoos put him through to the Chairman's home phone.

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

From: ET07 Hoc
To: Batkin, Joshua
Sent: Thu Mar 24 07:44:56 2011
Subject: Call between Chairman and Amb. Roos

Josh:
Please let the Chairman know that the Ambassador will call him in about 30 minutes. He is currently in meetings and expects to be free then.

Thanks,
Jane Marshall
(ET Status Officer du jour)

QQQ | 124

From: RMTPACTSU_ELNRC <RMTPACTSU_ELNRC@ofda.gov>
Sent: Thursday, March 24, 2011 1:56 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: FYI: Travel Reservation March 27 for JACK WARREN FOSTER

FYI

From: rmtpactsu_ac@ofda.gov [mailto:rmtpactsu_ac@ofda.gov]
Sent: Thursday, March 24, 2011 1:42 PM
To: Foster, Jack; RMTPACTSU_ELNRC; Johnson, Natalya
Subject: Travel Reservation March 27 for JACK WARREN FOSTER

JACK WARREN FOSTER has asked us to deliver their itinerary information to you. You can click here to view their travel information using Sabre® Virtually There®

000125

From: LIA10 Hoc
Sent: Thursday, March 24, 2011 7:36 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: Attachment to investigation results on radiation exposure
Attachments: Attachment to investigation results on radiation exposure Unit 3.docx

See the Attachment to investigation results on radiation exposure.

QQQ/126

Regarding the investigation results on radiation exposure of the workers of cooperating companies at the Fukushima Daiichi Nuclear Power Plant Unit 3 turbine building

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

Although this power plant is currently shut down due to the impact from Tohoku Pacific Earthquakes, more than 170 mSv of dose was detected from three workers of cooperating companies who were engaged in laying cables on the first floor and first basement floor of the Unit 3 turbine building. Also with two of three workers radioactive materials were confirmed on the skin of both feet.

As the body area with radioactive materials of two workers from cooperating companies was cleansed, it was determined that there is possibility of beta ray burning. So they were transported to Fukushima Prefecture Medical College Hospital and, after diagnosis there, it was decided that they will be transferred to Radiology Medicine General Research Institute in Chiba Prefecture on March 25 (today) and be placed under observation for about 4 days. Also, as soon as the evaluation results on the water into which the workers put their feet become available, there results were to be notified. (Already notified)

This time, we inform you of the results of investigation of the work environment the workers were in as follows:

Dose rate on the surface of the water: About 400 mSv/h
Results of gamma ray nuclide analysis on the sample from the stagnant water

Location	Stagnant water in the basement of Unit 3 turbine building of Fukushima Daiichi NPP
Name of nuclide	Specimen concentration (Bq/cm^3)
Cobalt 60	About 7.0×10^3
Technetium 99m	About 2.5×10^8
Iodine 131	About 1.2×10^6
Cesium 134	About 1.8×10^6
Cesium 136	About 2.3×10^4
Cesium 137	About 1.8×10^5
Barium 140	About 5.2×10^4
Lanthan 140	About 9.4×10^3
Cerium 144	About 2.2×10^8
Total	About 3.9×10^6

Also, we will continue evaluation on the beta ray exposure dose on the skin.

With regard to the cause of this, we speculate that they assumed that the dose rate is low in the work area based on the on-site does survey results measured by TEPCO employees on March 23, failed to notice the change of the work environment on the day of the work (March 24) and continued the work despite the alert from the individual dose meter was issued.

From now on, we will again make sure that TEPCO employees and cooperating company workers adequately recognize the alert from the individual dose meter and evacuate from the area when such alert is issued.

End

From: Henderson, Karen
Sent: Thursday, March 24, 2011 1:41 PM
To: LIA02 Hoc; LIA03 Hoc
Cc: Jones, Andrea; Schwartzman, Jennifer
Subject: howdy and help, please

Can you access WebEOC, please, and copy off the OPA talking points to be used with the public and FAQs re Japan, and send them to Andrea, Jen and me?

Call me if you need additional info.

Cheers,

Karen

Dr. Karen Henderson
Senior Level Foreign Policy Advisor
Office of International Programs
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
Tel: 301.415.0202
Fax: 301.415.2395
Email: Karen.Henderson@nrc.gov

000127

From: RST01 Hoc
Sent: Thursday, March 24, 2011 11:56 PM
To: Hasselberg, Rick; Alter, Peter
Cc: Brown, Eva; RST01 Hoc
Subject: RST Watchbill

Follow Up Flag: Follow up
Flag Status: Flagged

Rick/Peter,

On Monday, 3/21, Eva Brown offered to do Mids thru 4/2. The schedule shows Jim Shea. There are some discrepancies between RST and OST schedules. Please rectify this situation during the day on Friday.

I filled in several spots on the watch bill where I could fill in over the next 2 weeks.

Thanks,

Brett

000128

News Release

経済産業省
Ministry of Economy, Trade and Industry

March 25, 2011
Nuclear and Industrial Safety Agency

Seismic Damage Information (the 52nd Release)
(As of 19:30 March 25th, 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. Exposure of Workers

On March 24th, three workers (All the people were the subcontractor's employees.) who were laying cables on the ground floor and the basement floor of the turbine building of Unit 3 were confirmed to be at the level of exposure more than 170mSv. Regarding the two of them, the attachment of radioactive material on the skin of both legs was confirmed. As the two workers were judged to have a possibility of beta ray burn, they were transferred to the Fukushima Medical University Hospital, and at 16:44 March 25th, all of the three workers arrived at the National Institute of Radiological Sciences in the Chiba Prefecture. The three workers had no serious problem in the condition of the whole body, were fully conscious and ambulatory. Currently, they are being examined concerning exposed dose and so on.

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/cm^3 in total of each nuclides.

2. Nuclear Power Stations (NPSs)

- Fukushima Dai-ichi NPS

・ Injection of fresh water to the Reactor Pressure Vessel of Unit 1 was

2222 | 129

started. (15:37 March 25th)

- Water spray for Unit 3 by Kawasaki City Fire Bureau supported by Tokyo Fire Department was carried out. (From 13:28 till 16:00 March 25th)
- Injection of fresh water to the Reactor Pressure Vessel of Unit 3 was started. (18:02 March 25th)
- Water spray for Unit 4 using Concrete Pump Truck (50t/h) was started. (19:05 March 25th)
- Power supply for the temporary pump for Residual Heat Removal Seawater System (RHRS) of Unit 6 was switched from the temporary to the permanent. (15:38 and 15:42 March 25th)

(Attached sheet)

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

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

(1) The state of operation

Unit 1 (460MWe):	automatic shutdown
Unit 2 (784MWe):	automatic shutdown
Unit 3 (784MWe):	automatic shutdown
Unit 4 (784MWe):	in periodic inspection outage
Unit 5 (784MWe):	in periodic inspection outage, cold shutdown at 14:30 March 20th
Unit 6 (1,100MWe):	in periodic inspection outage, cold shutdown at 19:27 March 20th

(2) Major Plant Parameters (As of 18:00 March 25th)

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Reactor Pressure*1 [MPa]	0.453(A) 0.453(B)	0.085(A) 0.083(B)	0.137(A) 0.002(C)	—	0.108	0.109
CV Pressure (D/W) [kPa]	275	120	108	—	—	—
Reactor Water Level*2 [mm]	−1,650(A) −1,600(B)	−1,400(A) Not available(B)	−1,900(A) −2,300(B)	—	2,288	2,216
Suppression Pool Water Temperature (S/C) [℃]	—	—	—	—	—	—
Suppression Pool Pressure (S/C) [kPa]	275	down scale	190	—	—	—
Spent Fuel Pool Water Temperature [℃]	—	52	—	Incorrect Indication	37.9	22.0
Time of Measurement	16:30 March 25th	14:00 March 25th	16:10 March 25th	11:00 March 24th	18:00 March 25th	18:00 March 25th

*1: Converted from reading value to absolute pressure

*2: Distance from the top of fuel

(3) Situation of Each Unit

<Unit 1>

- TEPCO reported to NISA the event (Inability of water injection of the Emergency Core Cooling System) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (16:36 March 11th)
- Operation of Vent (10:17 March 12th)
- Seawater injection to the Reactor Pressure Vessel (RPV) via the Fire Extinguish Line started. (20:20 March 12th)
  →Temporary interruption of the injection (01:10 March 14th)
- The sound of explosion in Unit 1 occurred. (15:36 March 12th)
- The amount of injected water to the to the Reactor Core was increased by utilizing the Water Supply Line in addition to the Fire Extinguish Line. ($2m^3/h \rightarrow 18m^3/h$).(02:33 March 23rd) Later, it was switched to the Water Supply Line only (around $11m^3/h$). (09:00 March 23rd)
- Lighting in the Central Operation Room was recovered. (11:30 March 24th)
- White smoke was confirmed to generate continuously. (Around 06:20 March 25th)
- Fresh water injection to RPV was started. (15:37 March 25th)

<Unit 2>

- TEPCO reported to NISA the event (Inability of water injection of the Emergency Core Cooling System) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (16:36 March 11th)
- Operation of Vent (11:00 March 13th)
- The Blow-out Panel of reactor building was opened due to the explosion in the reactor building of Unit 3. (After 11:00 March 14th)
- Reactor water level tended to decrease. (13:18 March 14th) TEPCO reported to NISA the event (Loss of reactor cooling functions) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (13:49 March 14th)

- Seawater injection to RPV via the Fire Extinguish line was ready. (19:20 March 14th)
- Water level in RPV tended to decrease. (22:50 March 14th)
- Operation of Vent (0:02 March 15th)
- A sound of explosion was made in Unit 2. As the pressure in Suppression Chamber decreased (06:10 March 15th), there was a possibility that an incident occurred in the Chamber. (About 06:20 March 15th)
- Electric power receiving at the emergency power source transformer from the external transmission line was completed. The work for laying the electric cable from the facility to the load side was carried out. (As of 13:30 March 19th)
- Injection of 40t of Seawater to the Spent Fuel Pool was started.(from 15:00 till 17:20 March 20th)
- Power Center of Unit 2 received electricity (15:46 March 20th)
- White smoke generated. (18:22 March 21st)
- White smoke was died down and almost invisible. (As of 07:11 March 22nd)
- Injection of 18t of Seawater to the Spent Fuel Pool was carried out. (From 16:07 till 17:01 March 22nd)
- White smoke was confirmed to generate continuously. (Around 06:20 March 25th)
- Injection of seawater to the Spent Fuel Pool via the Fuel Pool Cooling Line was carried out. (From 10:30 till 12:19 March 25th)
- Seawater injection to RPV continues. (As of 19:30 March 25th)

<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-Defence Force. (9:48, 9:52, 9:58 and 10:01 March 17th)
- The riot police arrived at the site for the water spray from the grand. (16:10 March 17th)
- The Self-Defence Force started the water spray using a fire engine. (19:35 March 17th)
- The water spray from the ground was carried out by the riot police. (From 19:05 till 19:13 March 17th)
- The water spray from the ground was carried out by the Self-Defense Force using 5 fire engines. (19:35, 19:45, 19:53, 20:00 and 20:07 March 17th)
- The water spray from the ground using 6 fire engines (6 tons of water spray per engine) was carried out by the Self-Defence Force. (From before 14:00 till 14:38 March 18th)
- The water spray from the ground using a fire engine provided by the US Military was carried out. (Finished at 14:45 March 18th)
- Hyper Rescue Unit of Tokyo Fire Department arrived at the Main Gate (23:10 March 18th) and entered the NPS in order to spray water from the ground. (23:30 March 18th)
- Hyper Rescue Unit of Tokyo Fire Department carried out the water

spray. (Finished at 03:40 March 20th)

- The pressure in PCV of Unit 3 rose (320 kPa as of 11:00 March 20th). Preparation to lower the pressure was carried. Judging from the situation, immediate pressure relief was not required. Monitoring the pressure continues (120 kPa at 12:15 March 21st).
- On-site survey for leading electric cable (From 11:00 till 16:00 March 20th)
- Water spray over the Spent Fuel Pool of Unit 3 by Hyper Rescue Unit of Tokyo Fire Department was carried out (From 21:30 March 20th till 03:58 March 21st).
- Works for the recovery of external power supply is being carried out.
- Grayish smoke generated from Unit 3. (At around 15:55 March 21st)
- The smoke was confirmed to be died down. (17:55 March 21st)
- Grayish smoke changed to be whitish and seems to be ceasing. (As of 07:11 March 22nd)
- Water spray (Around 180t) by Hyper Rescue Unit of Tokyo Fire Department was carried out. (from 15:10 till 15:59 March 22nd)
- Lighting was recovered in the Central Operation Room. (22:43 March 22nd)
- Injection of 35t of seawater to the Spent Fuel Pool via the Fuel Pool Cooling Line was carried out. (From 11:03 till 13:20 March 23rd)
- Slightly blackish smoke generated from the reactor building. (Around 16:20 March 23rd) At around 23:30 March 23rd and around 4:50 March 24th, it was reported that the smoke seemed to cease.
- Around 120t of seawater was injected to the Spent Fuel Pool via the Fuel Pool Cooling Line. (From around 5:35 till around 16:05 March 24th)
- Water spray by Kawasaki City Fire Bureau supported by Tokyo Fire Department was carried out. (From 13:28 till 16:00 March 25th)
- Fresh water injection to RPV was started. (18:02 March 25th)

<Unit 4>

- Because of the replacement work of the Shroud of RPV, no fuel was inside the RPV.
- The temperature of water in the Spent Fuel Pool had increased. (84 ℃ at 04:08 March 14th)

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

<Units 5 and 6>

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

up. (04:22 March 19th)

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

<Common Spent Fuel Pool>

- It was confirmed that the water level of Spent Fuel Pool was maintained full at after 06:00 March 18th.
- As of 09:00 March 19th, the water temperature in the pool is 57℃.
- Water spray over the Common Spent Fuel Pool was started (From 10:37 till 15:30 March 21st)
- As of 16:30 March 21st, water temperature of the pool was around 61℃.
- As of 13:15 March 23rd, water temperature of the pool was around 57℃.
- The power was started to be supplied (15:37 March 24th) and cooling was also started.(18:05 March 24th)
- As of 18:05 March 24th, water temperature of the pool was around 73℃.

- Fukushima Dai-ni NPS (TEPCO)

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

(1) The state of operation

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

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

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

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

(2) Major plant parameters (As of 18:00 March 25th)

	Unit	Unit 1	Unit 2	Unit 3	Unit 4
Reactor Pressure*1	MPa	0.15	0.13	0.11	0.13
Reactor water temperature	℃	29.5	28.9	33.9	29.4
Reactor water level*2	mm	9,146	10,246	8,513	8,785
Suppression pool water temperature	℃	25	26	27	28
Suppression pool pressure	kPa (abs)	107	106	104	105
Remarks		cold shutdown	cold shutdown	cold shutdown	cold shutdown

*1: Converted from reading value to absolute pressure

*2: Distance from the top of fuel

(3) 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 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. 1.1 μ SV/h (16:00 March 24th) → approx. 0.98 μ SV/h (16:00 March 25th)

(3) Report concerning other incidents

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

2. Action taken by NISA

(March 11th)

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

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

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

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

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

19:03 The Government declared the state of nuclear emergency. (Establishment of 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

(March12th)

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

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

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

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

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

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

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

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

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

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

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 recognised the event (Loss of reactor cooling function) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

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

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

(March 15th)

00:00: The acceptance of experts from IAEA was decided. NISA agreed to

accept the offer of dispatching of the expert on NPS damage from IAEA considering the intention by Mr. Amano, Director General of IAEA. Therefore, the schedule of expert acceptance will be planned from now on according to the situation.

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

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

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

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

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

10:30 According to the Nuclear Regulation Act, 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 Iidate Village) was issued regarding the change of the reference value for the screening level for decontamination of radioactivity.

(March 21st)

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

16:45 Directive titled as "Ventilation for using heating equipments within the in-house evacuation zone" was issued from the 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), 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 12:30 March 25th) >

1. Exposure of residents

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

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

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

No. of Counts	No. of Persons
18,000cpm	1
30,000-36,000cpm	1
40,000cpm	1
little less than 40,000cpm*	1

very small counts	5

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

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

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

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

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 was 14 (All the people were TEPCO's employees.), as of the morning of March 24th. Furthermore, on 24th, 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 17.

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, and after that,

at 16:44 of March 25th, all of the three workers arrived at the National Institute of Radiological Sciences in the Chiba Prefecture. The three workers had no serious problem in the condition of the whole body, were fully conscious and ambulatory. Currently, they are being examined concerning exposed dose and so on.

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/cm^3 in total of each nuclides.

3. Others

(1) Fukushima Prefecture has started the screening from 13 March. It is carried out by rotating the evacuation sites and at the 14 places (set up permanently) such as health offices. Up until March 24th, the screening was done to 87,813 people. Among them, 98 people were above the 100,000cpm, but when measured these people again without clothes, etc., the counts decreased to 100,000cpm and below, and there was no case which affects health.

(2) 4 members of Self-Defence Force who worked in Fukushima Dai-ichi NPS were injured by explosion. One member was transferred to National Institute of Radiological Sciences. After the examination, judged that there were wounds but no risk for health from the exposure, the one was released from the hospital on March 17th. No other exposure of the Self-Defence Force member was confirmed at the Ministry of Defence.

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

(4) 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/cm^2 measured by a gamma-ray survey meter or 6,000 cpm

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

<Directives of administrating stable Iodine during evacuation>

(1) On March 16th, the Local 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 judgements.

<Situation of the injured (As of 08:00 March 25th)>

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.

- March 21st : Spinach and *Kakina* (a green vegetable) (Fukushima, Ibaraki, Tochigi and Gunma Prefectures), Raw milk (Fukushima Prefecture)
- March 23rd : Raw milk and Parsley (Ibaraki Prefecture), non-head type leafy vegetables and head type leafy vegetables (Spinach, *Komatsuna* (a green vegetable) , etc.), flowerhead brassicas (Broccori, etc.) (※) and Turnip (Fukushima Prefecture)

  (※) Direction for restriction of intake was also issued on the same day as to non-head type leafy vegetables, head type leafy vegetable, and flowerhead brassiccas.

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

On March 21st, Directive titled as "Ventilation for using heating equipments within the in-house evacuation zone" from the 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.

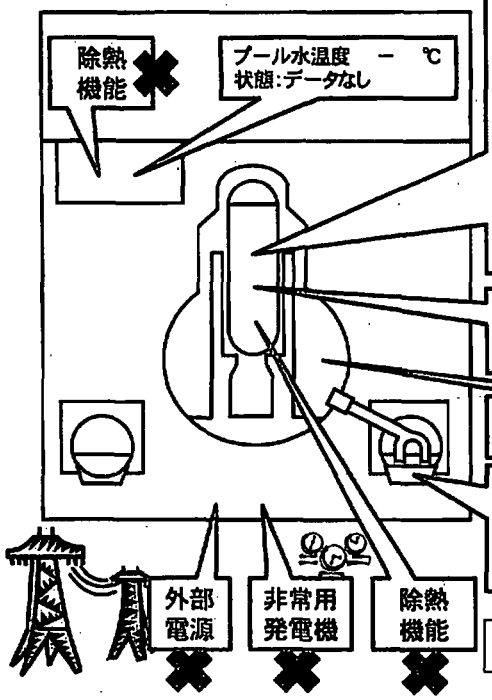
< Fire Bureaus' Activities>

- 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.

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

福島第一原子力発電所1号機の状況
（3月25日　18:00現在）



原子炉圧力A　0．453MPa※
原子炉圧力B　0．453Mpa※
状態:下降傾向
※:絶対圧に換算

原子炉水位A　－1650mm
原子炉水位B　－1600mm
状態:燃料頂部から上記水位が冠水していない。

原子炉水温度　－　℃
状態:データなし

原子炉圧力容器温度:
給水ノズル温度　196．9℃
圧力容器下部温度　148．5℃

原子炉格納容器圧力　0．275MPa
状態:下降傾向

S／P水温　－　℃
状態:データなし

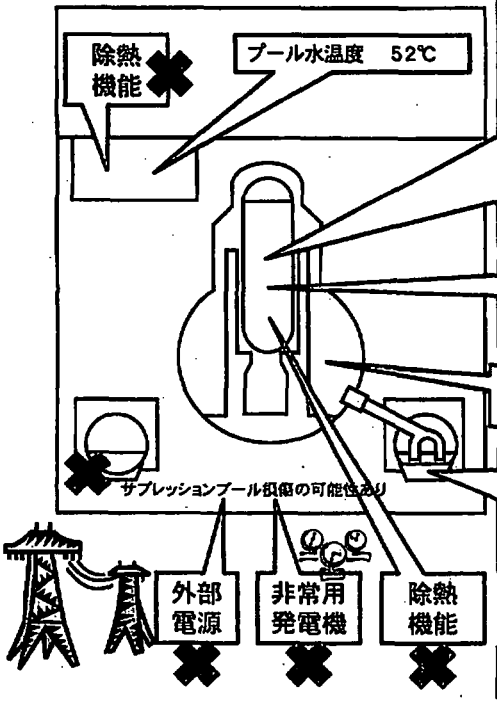
S／P圧力　0．275MPa
状態:下降傾向

発生後の主要なできごと

11日14:46　運転中、地震により自動停止
11日15:42　10条通報(全交流電源喪失)
11日16:36　15条事象の発生
（非常用炉心冷却装置注水不能）
12日01:20　15条事象の発生
（格納容器圧力異常上昇）
12日10:17　ベント開始
12日15:36　爆発音
12日20:20　海水及びホウ酸の炉心注入開始
23日02:33　消火系に加え、給水系を使うことにより炉心への注水量を増量（2m³/h→18m³/h)。9:00に給水系のみに切替(18m³/h→11m³/h)
24日11:30　中央制御室の照明復帰
25日15:37　淡水の炉心注入開始

現状:海水の炉心注入を継続

福島第一原子力発電所2号機の状況
（3月25日　18:00現在）



原子炉圧力A　0．085MPa※
原子炉圧力B　0．083Mpa※
状態:大きな変動なし
※:絶対圧に換算

原子炉水位A　－1400mm
状態:燃料頂部から上記水位が冠水していない。

原子炉水温度　－　℃
状態:データなし

原子炉圧力容器温度:
給水ノズル温度　107℃
圧力容器下部温度　104℃

原子炉格納容器圧力　0．12MPa
状態:大きな変動なし

S／P水温　－　℃
状態:データなし

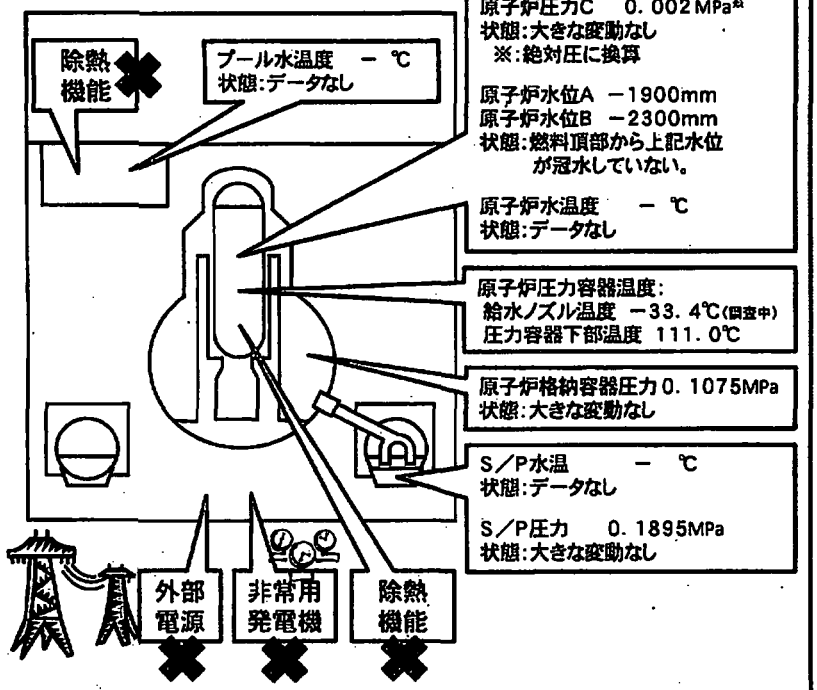
S／P圧力　－　MPa
状態:ダウンスケール

発生後の主要なできごと

11日14:46　運転中、地震により自動停止
11日15:42　10条通報(全交流電源喪失)
11日16:36　15条事象の発生
（非常用炉心冷却装置注水不能）
13日11:00　ベント開始
14日13:25　15条事象の発生
（原子炉冷却機能喪失）
14日16:34　海水の炉心注入開始
14日22:50　15条事象の発生
（格納容器圧力異常上昇）
15日0:02　ベント開始
15日06:10　爆発音発生
15日06:20頃　サプレッションプール(圧力抑制室)損傷の可能性あり
20日15:05～17:20　使用済燃料プール冷却系(FPC)から使用済燃料プール(SFP)に約40tの海水を注水
20日15:46　パワーセンター受電
21日18:22　白煙が発生。22日7:11にほとんど見えない程度に減少
22日16:07　SFPに約18tの海水を注水
25日10:30～12:19　FPCからSFPに海水を注水

現状:プール及び炉心への海水注入を継続

福島第一原子力発電所3号機の状況
（3月25日　18:00現在）



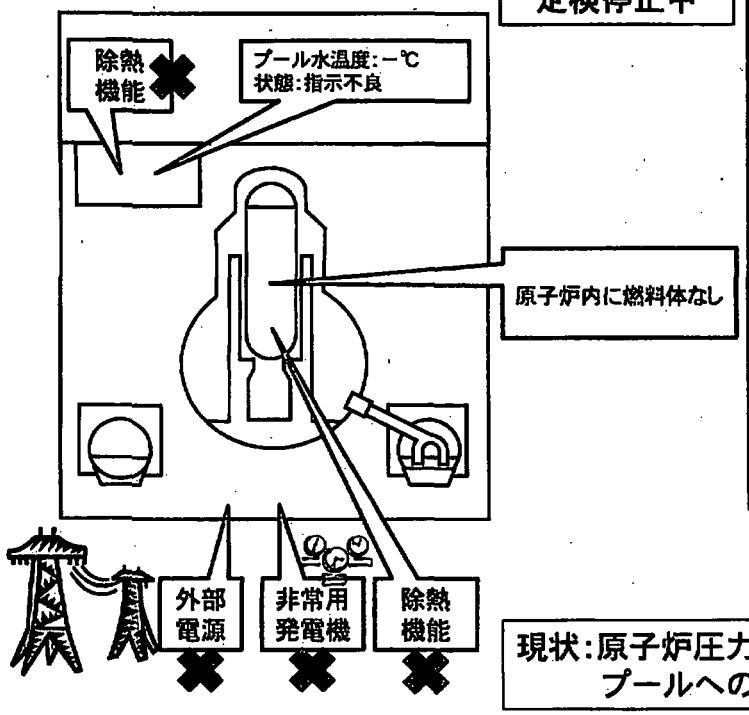
現状:プール及び炉心への海水注入を継続

発生後の主要なできごと

11日14:46　運転中、地震により自動停止
11日05:42　10条通報(全交流電源喪失)
12日20:41　ベント開始
13日05:10　15条事象の発生
(非常用炉心冷却装置注水不能)
13日09:20　ベント開始
13日13:12　海水及びホウ酸の炉心注入開始
14日05:20　ベント開始
14日07:44　15条事象の発生(格納容器圧力異常上昇)
14日11:01　爆発音
16日08:30頃　白煙が発生
17日09:48～10:01　自衛隊ヘリによる放水(計4回)を実施
17日19:05～20:07　高圧放水車による散水(警察1回、自衛隊5回)
18日14時前～14:38　自衛隊消防車6台による地上放水
～14:45　米軍消防車1台による地上放水
19日0:30～01:10　東京消防庁ハイパーレスキュー隊放水
19日14:10～20日3:40　東京消防庁ハイパーレスキュー隊放水
20日 11:00　格納容器内圧力が上昇(320kPa)。その後、低下。
20日21:36～21日3:58　東京消防庁ハイパーレスキュー隊放水
21日15:55頃　灰色がかった煙が発生。17:55に煙が収まっていることを確認
22日15:10～16:00　東京消防庁ハイパーレスキュー隊及び大阪市消防局放水
22日22:43　中央制御室の照明復帰
23日11:03～13:20　使用済燃料プール冷却系(FPC)から使用済燃料プール(SFP)に約35tの海水を注水
23日16:20頃　黒煙が発生。23:30頃及び24日4:50に煙の発生が止んでいることを確認。
24日05:35～16:05　FPCからSFPに約120tの海水を注水
25日13:28～16:00　川崎市消防局による放水
25日18:02　淡水の炉心注入開始

福島第一原子力発電所4号機の状況
（3月25日　18:00現在）

定検停止中

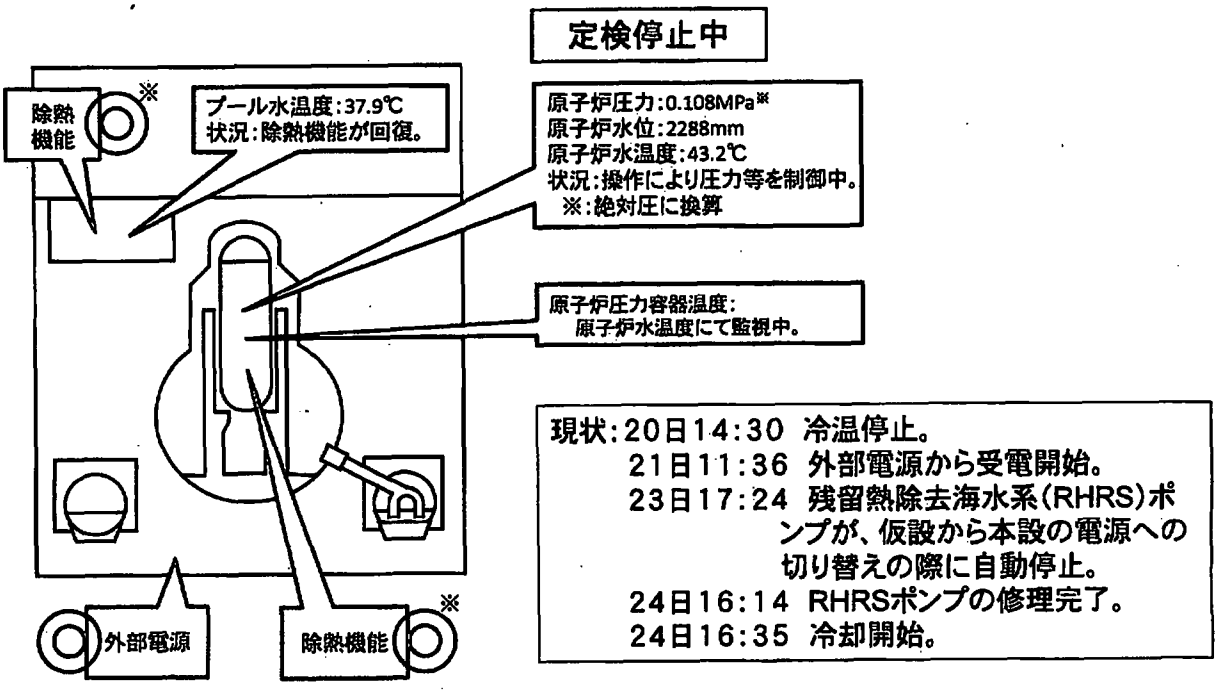


現状:原子炉圧力容器に燃料体が存在しない
プールへの海水注入開始

発生後の主要なできごと

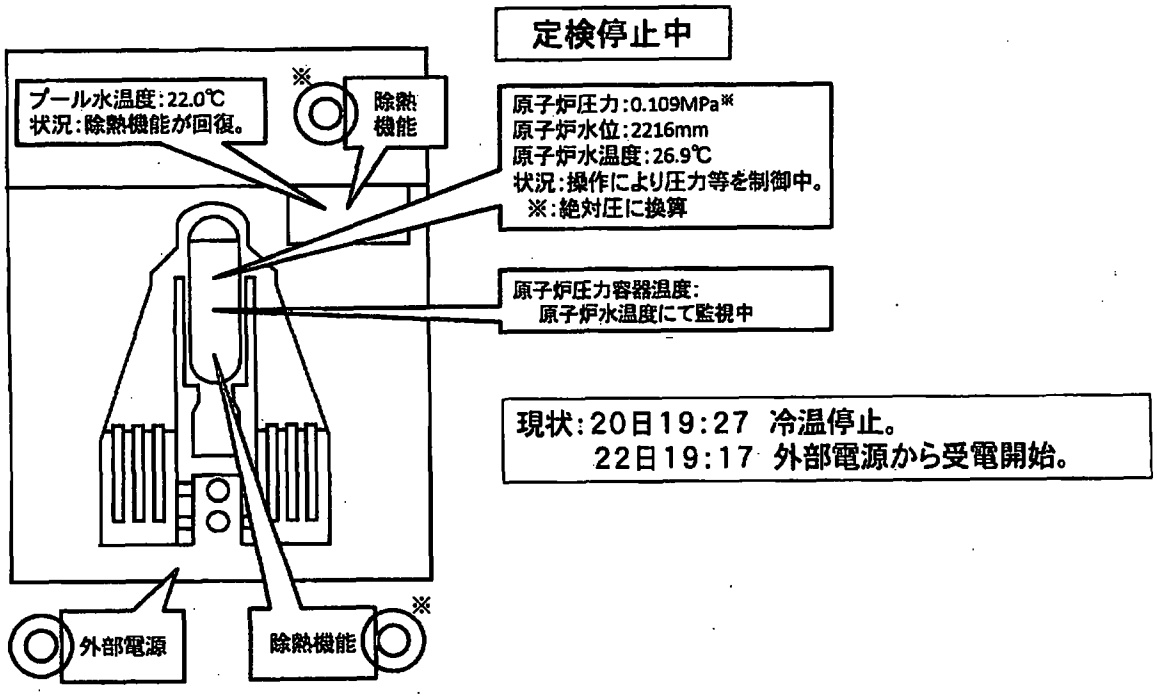
地震発生時、定期検査により停止中
11日15:42　第10条通報(全交流電源喪失)
14日04:08　使用済燃料プール温度84℃
15日06:14　4Fの壁が一部破損の確認
15日09:38　3階部分で火災(12:25鎮火)
16日05:45　4号機で火災。事業者によると現場での火は確認できず(06:15)
20日08:21～9:40　自衛隊による使用済燃料プール(SFP)への放水
20日18:30頃 ～ 19:46　自衛隊によるSFPへの放水
21日06:37～08:41　自衛隊によるSFPへの放水
21日15:00頃　パワーセンターまでのケーブル敷設完了
22日10:35　パワーセンター受電
22日17:17～20:32　コンクリートポンプ車による放水
23日10:00～13:02　コンクリートポンプ車による放水
24日14:36～17:30　コンクリートポンプ車による放水
25日06:05～10:20　使用済燃料プール冷却系(FPC)からSFPに海水を注入
25日18:00　コンクリートポンプ車による放水

福島第一原子力発電所5号機の状況
（3月25日　18:00現在）



※ 炉水とプール水を切替えて除熱

福島第一原子力発電所6号機の状況
（3月25日　18:00現在）



※ 炉水とプール水を切替えて除熱

From: Schwartzman, Jennifer
Sent: Friday, March 25, 2011 9:11 AM
To: LIA02 Hoc
Cc: LIA03 Hoc
Subject: RE: PLEASE PROVIDE ME WITH MORE SPECIFIC INFORMATION

Might need to walk back there – they are hardly ever at the machines.

From: LIA02 Hoc
Sent: Friday, March 25, 2011 9:00 AM
To: Schwartzman, Jennifer
Cc: LIA03 Hoc
Subject: RE: PLEASE PROVIDE ME WITH MORE SPECIFIC INFORMATION

I sent out requests to RST and PMT, now need to wait and see if I get a response.

Steve

From: Schwartzman, Jennifer
Sent: Friday, March 25, 2011 8:55 AM
To: LIA02 Hoc
Cc: LIA03 Hoc
Subject: RE: PLEASE PROVIDE ME WITH MORE SPECIFIC INFORMATION

Let me know if you need any help.

From: LIA02 Hoc
Sent: Friday, March 25, 2011 8:55 AM
To: Schwartzman, Jennifer
Cc: LIA03 Hoc
Subject: RE: PLEASE PROVIDE ME WITH MORE SPECIFIC INFORMATION

Jen,

Thank you for your input.

Steve

From: Schwartzman, Jennifer
Sent: Friday, March 25, 2011 8:21 AM
To: LIA02 Hoc
Cc: LIA03 Hoc
Subject: RE: PLEASE PROVIDE ME WITH MORE SPECIFIC INFORMATION

I'm assuming he has pulled those things out of our status reports or OIP's transition updates. He wants the highlighted items -

1. The set of recommendations pertaining to severe accident management strategies that was provided to the NRC team in Japan

0001 130

2. The NARAC results, when they become available today
3. The exposure data the PMT is providing to NARAC

I would read the last Ops Center status report and see if these things came out of there. Then I would go talk to the PMT director about items 2 and 3, and I would find out from whoever put the status report together who was responsible for providing the information in item 1. Be clear with everyone you talk to that this is for Ambassador Davies in Vienna, it is not for the IAEA. (So it's within the federal family).

Let me know if you need help.

From: LIA02 Hoc
Sent: Friday, March 25, 2011 8:18 AM
To: Schwartzman, Jennifer
Cc: LIA03 Hoc
Subject: FW: PLEASE PROVIDE ME WITH MORE SPECIFIC INFORMATION

Jen,

Do you understand what Mark is asking for. For these items, we do not even know what he is talking about.

Steve

From: Shaffer, Mark R [mailto:ShafferMr@state.gov]
Sent: Friday, March 25, 2011 7:46 AM
To: LIA03 Hoc; LIA02 Hoc
Cc: Schwartzman, Jennifer
Subject: PLEASE PROVIDE ME WITH MORE SPECIFIC INFORMATION

With regard to the three items highlighted below, I would be most appreciative if can you please share the information with me. This is exactly the type of information that the Ambassador needs to be briefed on, but I don't seem to be in the loop on much of this stuff. If it is being sent to the NRC team in Japan, surely I'm authorized to see it too.

The NRC Reactor Safety Team has provided **a set of recommendations pertaining to severe accident management strategies to the NRC** team in Japan. The recommendations were coordinated with GEH, EPRI, INPO, Naval Reactors, and DOE.

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 in_2 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.**

This email is UNCLASSIFIED.

From: LIA06 Hoc
Sent: Friday, March 25, 2011 1:08 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: FW: New Traveler

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

From: LIA02 Hoc
Sent: Friday, March 25, 2011 12:39 PM
To: LIA06 Hoc; LIA08 Hoc
Subject: FW: New Traveler

From: RMTPACTSU_ELNRC [mailto:RMTPACTSU_ELNRC@ofda.gov]
Sent: Friday, March 25, 2011 11:59 AM
To: Owen, Lucy
Cc: Collins, Elmo; LIA02 Hoc
Subject: RE: New Traveler

Ms. Owens:

My name is Joe Anderson, and I am the NRC Liaison at USAID, which will be coordinating travel for Mr. Collins to Japan on Tuesday, March 29. Mr. Collins will be travelling under a USAID Travel Authorization. To support TA issuance, the information below will be needed.

To avoid the possible release of PII, I would appreciate your calling the NRC Liaison position at USAID (202-712-4383 / -4384) at your earliest convenience. Mr. Jason Kozal and myself are on duty at USAID today. Thank you.

Need to discuss coordination. How do you want to collect required travel information from these individuals? We can: (1) have LT collect and forward to us (USAID); OR (2) we can call them directly (if you provide phone nos.) to obtain directly from them. Your choice.

Personal Information
Full name:
SSN:
Home Address:

Passport Information
Passport No.:
DOB:
Place of Birth:
Type (Official, personal, diplomatic):
Date of Issuance:
Place of Issuance:

QQQ | 131

Expiration Date:

Emergency Contact Information
Name:
Relationship:
Phone No.:
E-Mail:

Finally, since the Travel Authority will be USAID we need the following Banking information to expense reimbursement purposes:

Bank Name:
Account Number:
Routing Number:

From: LIA02 Hoc [mailto:LIA02.Hoc@nrc.gov]
Sent: Friday, March 25, 2011 11:36 AM
To: Carter, Mary; Liaison Japan; Doane, Margaret; Mamish,Nader; Abrams, Charlotte
Cc: Collins, Elmo; Owen, Lucy; LIA03 Hoc; Ramsey, Jack; LIA08Hoc; LIA06 Hoc; Dudek, Michael; RMTPACTSU_ELNRC
Subject: New Traveler

We were just informed by Michele Evans (ET) that Elmo Collins will be leaving on Tuesday, March 29.

Steve

From: LIA02 Hoc
Sent: Friday, March 25, 2011 12:06 PM
To: LIA06 Hoc; LIA08 Hoc; LIA03 Hoc
Subject: FW: New Traveler

From: LIA02 Hoc
Sent: Friday, March 25, 2011 12:04 PM
To: Mamish, Nader
Cc: Evans, Michele
Subject: RE: New Traveler

According to Michele, he is replacing Dan Dorman, who will be coming back on about April 2.

From: Mamish, Nader
Sent: Friday, March 25, 2011 11:58 AM
To: LIA02 Hoc
Cc: Evans, Michele
Subject: RE: New Traveler

Is Elmo replacing anyone or is he an addition to the team?

From: LIA02 Hoc
Sent: Friday, March 25, 2011 11:36 AM
To: Carter, Mary; Liaison Japan; Doane, Margaret; Mamish, Nader; Abrams, Charlotte
Cc: Collins, Elmo; Owen, Lucy; LIA03 Hoc; Ramsey, Jack; LIA08 Hoc; LIA06 Hoc; Dudek, Michael; RMTPACTSU_ELNRC
Subject: New Traveler

We were just informed by Michele Evans (ET) that Elmo Collins will be leaving on Tuesday, March 29.

Steve

000132

From: LIA02 Hoc
Sent: Friday, March 25, 2011 11:47 AM
To: RMTPACTSU_ELNRC
Cc: LIA03 Hoc; LIA08 Hoc; LIA06 Hoc
Subject: RE: New Traveler

Do you have a question.

From: RMTPACTSU_ELNRC [mailto:RMTPACTSU_ELNRC@ofda.gov]
Sent: Friday, March 25, 2011 11:45 AM
To: LIA02 Hoc
Cc: LIA03 Hoc; LIA08 Hoc; LIA06 Hoc
Subject: RE: New Traveler

From: LIA02 Hoc [mailto:LIA02.Hoc@nrc.gov]
Sent: Friday, March 25, 2011 11:36 AM
To: Carter, Mary; Liaison Japan; Doane, Margaret; Mamish,Nader; Abrams, Charlotte
Cc: Collins, Elmo; Owen, Lucy; LIA03 Hoc; Ramsey, Jack; LIA08Hoc; LIA06 Hoc; Dudek, Michael; RMTPACTSU_ELNRC
Subject: New Traveler

We were just informed by Michele Evans (ET) that Elmo Collins will be leaving on Tuesday, March 29.

Steve

aaa/133

From: Emche, Danielle
Sent: Friday, March 25, 2011 4:41 PM
To: LIA03 Hoc
Cc: Foggie, Kirk; Smith, Brooke
Subject: Re: Translator's notes from Chairman's call with NISA?

Ok, the notes would be nice but I don't want it to be an issue.
Danielle
Sent from an NRC BlackBerry.

From: LIA03 Hoc
To: Emche, Danielle
Sent: Fri Mar 25 15:56:11 2011
Subject: RE: Translator's notes from Chairman's call with NISA?

I talked with the translator and he is hesitant to send it out because all of the participants did not provide their consent about note-taking etc. I'm following up with Josh Batkin since our translator said that he took notes as well. I will let you know what I find out.

Thanks!
-Jenny

From: Emche, Danielle
Sent: Friday, March 25, 2011 3:41 PM
To: LIA03 Hoc
Subject: Re: Translator's notes from Chairman's call with NISA?

No, I haven't received them yet.
Danielle
Sent from an NRC BlackBerry.

From: LIA03 Hoc
To: Emche, Danielle
Sent: Fri Mar 25 15:35:43 2011
Subject: Translator's notes from Chairman's call with NISA?

Danielle,
You received these ok? Please mark them "OUO-Sensitive Foreign Government Information" if you print them out.

Thanks, travel safely!
-Jenny

000134

From: Shaffer, Mark R <ShafferMr@state.gov>
Sent: Friday, March 25, 2011 1:41 AM
To: LIA03 Hoc
Subject: Re: Path forward with IAEA coordination

Thanks

From: LIA03 Hoc <LIA03.Hoc@nrc.gov>
To: Schwartzman, Jennifer <Jennifer.Schwartzman@nrc.gov>; Shaffer, Mark R
Cc: Doane, Margaret <Margaret.Doane@nrc.gov>; LIA02 Hoc <LIA02.Hoc@nrc.gov>
Sent: Thu Mar 24 22:00:23 2011
Subject: Path forward with IAEA coordination

All,
Based upon a call this evening it sounds like DoD is taking the leadership role for the U.S. government. Since IAEA agreed to take a coordinating role, the U.S. government lead will have to work with the INPO individual to coordinate what is being requested from the U.S. government, what items the U.S. is actually providing and some idea of what other countries are providing. Marty briefly discussed this with Janice and I. I'm not sure on the next steps forward but thought you might know how we can progress on this issue.

Thanks!
-Jenny

QQQ/135

From: LIA08 Hoc
Sent: Friday, March 25, 2011 4:41 PM
To: LIA01 Hoc; LIA06 Hoc
Subject: RE: EPA lead on communicating environmental data - for the chronology and closing action

Thanks Jason!

Janelle

From: LIA01 Hoc
Sent: Friday, March 25, 2011 4:10 PM
To: LIA06 Hoc; LIA08 Hoc
Subject: FW: EPA lead on communicating environmental data - for the chronology and closing action

LT Director/Coordinator,

FYI. I posted this on the LT Log, Terry Reis and Kathy Brook (PMT) led the call on this. POC for DOE included in LT contact list in WebEOC.

Jason Lising
Federal Liaison

From: Hoc, PMT12
Sent: Friday, March 25, 2011 2:50 PM
To: PMT03 Hoc
Cc: LIA01 Hoc; LIA11 Hoc
Subject: EPA lead on communicating environmental data - for the chronology and closing action

PMT had a call with EPA and OSTP to discuss communicating with the public on environmental data. EPA will send an email to confirm what they will do, but they will take the lead. EPA would like to work with NRC OPA to do joint messaging, as they have been doing with DOE. DOE was not on the call.

2 message groups to communicate with: decision-makers and the public

0001 | 136

From: ET02 Hoc
Sent: Friday, March 25, 2011 9:49 AM
To: ET07 Hoc
Subject: FW: NSIR Ops Center SharePoint Site - Executive Briefing Background Book: Earthquake/Tsunami

Sally, not sure who to forward to, any ideas? If not I will work on it.

Jean

From: Baughman, James
Sent: Friday, March 25, 2011 9:48 AM
To: ET02 Hoc; Jackson, Karen
Cc: Baughman, James; Harper, Angela; Corbett, James; Partlow, Benjamin; Rich, Thomas; Bell, Marvin; Seeherman, Judy; Szyperski, Bill; Williams, Michael; Turner, Joseph; Offutt, David; Feibus, Jonathan; Bui, Thanh; Swiger, Roger; Chew, Elizabeth; Montgomery, Jack; Hoffman, Joan; Lee, Jun; Pena, Alex; Paradiso, Karen; Hayden, Gwen; Lopez, George; Rasouli, Houman; Tyler, Sean; Sean Tyler; Rittenhouse, Phil; 'Phil Rittenhouse'; Mott, Peter; Janney, Margie; Khan, Omar
Subject: NSIR Ops Center SharePoint Site - Executive Briefing Background Book: Earthquake/Tsunami

Hi Karen,

The Ops Center's *Executive Briefing Background Book for Earthquake/Tsunami* information portal is now available for you to use and is located on our SharePoint portal at: http://nsir-ops.nrc.gov/default.aspx

Permissions have been configured per your previous emails. From this site, you can create links to Japan event related sites, access the files from the Ops Center M:\ drive (contact us if you need assistance with this), create announcements, view and upload documents such as Fact Sheets, Site Maps, Plant Drawings, etc.), and obtain up to the minute event related news feeds from content distributers.

SharePoint support will be available for you and the Operations staff if assistance is needed with moving/uploading documents (e.g., from the Ops Center M:\ drive) as well as usability questions about the site. Your support contact is Peter Mott, 301-415-0102, Peter.Mott@nrc.gov. Peter is available on-site from 8am-6pm Monday through Friday. For support outside these hours, you can contact the Computer Data Center at 301-415-5015 and ask for SharePoint Support.

Feel free to contact me if you have any questions.

Thanks!
Jim

Jim Baughman
SharePoint Program Manager
Information and Records Services Division
Office of Information Services
301-415-5826

QQQ/137

From: LIA10 Hoc
Sent: Friday, March 25, 2011 5:56 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: Nikkei article 3/25 23:51 on radioactive materials at Units 1-3

Radioactive Materials with concentration of more than 10,000 times ordinary level detected In water on the basement of Unit 1 Fukushima Nuclear Power Station

2011/3/25 23:51

Tokyo Electric Power Company revealed in the night of March 25 that radioactive materials with concentration of more than 10,000 times ordinary level (normal concentration of radioactive materials in core water) were contained in the accumulated water in the basement of the turbine building of Unit 1 reactor of Fukushima Daiichi Nuclear Power Plant. The radiation dose rate on the surface of water was 200 mSv per hour.

On March 24, workers were irradiated by accumulated water in the basement of Unit 3 turbine building and radioactive materials with high concentration were detected. Accumulated water was also found in the basement of Unit 2 turbine building.

The dose rate on the surface of water at Unit 2 was 200 to 300 mSv per hour and the dose rate at Unit 3 was 400 mSv per hour. The water depth was 40 cm at Unit 1, 100 cm at Unit 2 and 150 cm at Unit 3. The work has been suspended in the areas of Units 1, 2 and 3 where accumulated water was found.

１号機地下の水からも１万倍の放射性物質　３号機と同水準

福島原発

2011/3/25 23:51

東京電力は 25 日夜、福島第１原子力発電所の１号機のタービン建屋の地下にたまっていた水に、通常の炉心の水の約１万倍の濃度の放射性物質が含まれていたことを明らかにした。水の表面の放射線量は毎時 200 ミリシーベルトだった。

24 日には３号機タービン建屋地下の水たまりで作業員が被曝（ひばく）し、水たまりから高濃度の放射性物質が検出されている。２号機のタービン建屋の地下でも水たまりが見つかっている。

２号機の水の表面の放射線量は毎時 200～300 ミリシーベルト、３号機は同 400 ミリシーベルトだった。水の深さは１号機が 40 センチ、２号機が 100 センチ、３号機が 150 センチ。１～３号機の水たまりがある個所での作業は中止している。

aaa| 138

From: LIA02 Hoc
Sent: Friday, March 25, 2011 12:18 PM
To: Stahl, Eric; LIA03 Hoc
Cc: Emche, Danielle
Subject: RE: Quick Requests
Attachments: UPDATED 0430 EDT (March 25, 2011) USNRC Earthquake/Tsunami Status Update

We need nothing...

From: Stahl, Eric
Sent: Friday, March 25, 2011 12:13 PM
To: LIA03 Hoc; LIA02 Hoc
Cc: Emche, Danielle
Subject: Quick Requests

Gents –

A couple of requests. Can you please send to me and Danielle:

- The updated traveler spreadsheet (w/ phone numbers, arrival times, etc.)
- The phone number for the NRC's direct line into Embassy-Tokyo
- The phone number for the International Liaison Desks at the NRC Ops Center
- The latest NRC and DOS SitReps

You need anything from me or Danielle?

Thanks,
Eric

2002/139

From: LIA08 Hoc
Sent: Friday, March 25, 2011 1:05 AM
To: LIA06 Hoc
Subject: FW: Relaxing protective action criteria
Attachments: Relaxing protective action criteria EDITS 03-22-2011.doc

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From: Hoc, PMT12
Sent: Thursday, March 24, 2011 12:28 PM
To: LIA08 Hoc
Subject: FW: Relaxing protective action criteria

The PMT Director has requested that the attached relaxation protective action criteria be provided to the Department of State/Ambassador.

From: PMT03 Hoc
Sent: Wednesday, March 23, 2011 4:17 PM
To: Hoc, PMT12
Subject: Relaxing protective action criteria

Fyi...

From: Hoc, PMT12
Sent: Tuesday, March 22, 2011 2:33 PM
To: PMT03 Hoc
Subject: FW:

Please use this distribution list for your email to the chairman on iodine.

From: Hoc, PMT12
Sent: Tuesday, March 22, 2011 1:01 PM
To: Jaczko, Gregory
Cc: Virgilio, Martin; Weber, Michael; Johnson, Michael; Miller, Charles; Moore, Scott; Cool, Donald; Tappert, John; Borchardt, Bill; Wiggins, Jim; Carpenter, Cynthia; Ordaz, Vonna; Batkin, Joshua; Coggins, Angela; Lubinski, John; Zimmerman, Roy; FOIA Response.hoc Resource; PMT03 Hoc; Lewis, Robert
Subject:

Chairman,

Please see the requested information regarding the process for relaxing protective action recommendations.

PMT

000140

Q: What are the criteria that the NRC would use to relax its previous protective action recommendation.

A: Brief response: Within the United States the decision to relax a protective action decision is based on confidence that any significant additional release is unlikely and on actual environmental measurements obtained and analyzed by the Federal Radiological Monitoring and Assessment Center (FRMAC) and that the plant is in a stable condition. These decisions are generally not made until the radioactivity release has been terminated and the source of the release is under control. The primary criteria for the decision to relocate a population from the affected area or allow re-entry to the affected area would be protective action guidance provided by the Environmental Protection Agency in its "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," EPA 400-R-92-001, May 1992. Generally, re-entry would not be allowed until the projected dose (based on actual measurements) due to ground deposition was less than 2 rem in the first year, or limiting doses as defined for the second through 50 years.

Explanation

For events which occur at nuclear facilities licensed by the Nuclear Regulatory Commission (NRC), the radiological annex to the National Response Framework, (NRF) defines the relationships between the Federal, state, and local emergency response organizations. In the early phase of the emergency, the operator of the facility (licensee) is expected, amongst other actions, to assess the conditions and recommend evacuation or sheltering protective actions to the affected state and local emergency response organizations. These protective actions recommendations may be based on plant status and prognosis, the results of radiological assessments and projections, or a combination of both. The NRC performs independent assessments of the conditions as a matter of regulatory oversight, and works with the licensee to resolve differences. The state and local

emergency response organizations consider the licensee's recommendation and decide upon the protective actions that will be implemented.

The early phase of the response ends when the radioactivity releases have been terminated, the plant is in a stable condition and the source of the radioactivity release is under control. The intermediate phase commences at this point.

Once the protective action decision (and any subsequent revisions) has been implemented, the decision to relax the protective actions and allow public re-entry to the affected areas is based on reassurance of no further release and on actual measurements and samples obtained in the affected area. The FRMAC, along with the affected states and local organizations, perform this assessment as the basis for decisions regarding relaxation of the protective actions to allow re-entry. The agencies that comprise the Interagency FRMAC, by statute, have the monitoring and assessment assets necessary to accomplish these tasks. Although the NRC will have representatives at the FRMAC, the NRC is not the lead federal agency for environmental monitoring under the radiological annex to the NRF, the lead is EPA.

In the United States, the EPA has established protective action guides for the intermediate phase that requires that the general population be relocated outside of the affected area if the projected effective dose equivalent from external gamma radiation from ground deposition and the committed effective dose equivalent from inhalation from re-suspended materials exceeds 2 rem in the first year. Re-entry would generally not occur as long as the projected dose in the first year exceeds 2 rem. It is important to note that are post plume assessments are based on the results of actual field measurements and sampling results. In the context of the Japanese event, these principals would still be generally applicable, although US field assessment capability should be augmented with available Japanese data.

CRITERIA

1. Radioactivity releases have been terminated and the source of the radioactivity release is under control.

2. Decision to allow public re-entry is based on field measurements and samples obtained from the affected area once the above criteria are satisfied.

3. Re-entry would not generally occur as long as the projected dose in the first years exceeds 2 rem, or exceeds 0.5 rem in the second year, or exceeds 5 rem in 50 years, depending on which case is most limiting.

M:\PMT\Relaxing protective action criteria.doc

From: LIA10 Hoc
Sent: Friday, March 25, 2011 7:12 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: Nikken article 3/26/11 Fresh water injection started

Nikkei 3/26/11

Fresh water injected into Fukushima NPP Units 1 and 3
Damage to Reactor Possible

2011/3/25 19:33 (updated 2011/3/26 0:47)

Tokyo Electric Power Company (TEPCO) shifted from sea water to fresh water injection to cool reactors at Units 1 and 3 of
Fukushima Daiichi Nuclear Power Plant in the afternoon of March 25. The (Japanese) Government started an operation to
Inject fresh water in collaboration with the U.S. military. This operation is to prevent blocking of pipes by salt. Meanwhile,
Radioactive materials with about 10,000 time concentration (compared to normal concentration of core water of an
operating reactor) were detected in accumulated water in the basement of Unit 1 turbine building, just like Unit 3 building
where workers were irradiated. Water is accumulated at Units 2 and 4 and is impeding restoration of cooling function.

Fresh water injection started at Unit 1 and Unit 3 at 3:37 pm and 6:02 pm respectively on March 25. Fresh water was channeled
directly from a dam at a distance of about 10 km using external power sources (which became available) into tanks located on
the premises of the Nuclear Power Plant and is injected into reactors with fire truck pumps.

It was originally planned to activate pumps on the basement floor of turbine buildings with external power supply and inject water.
However, the work environment is dangerous so fire pumps are being used for the time being. There is possibility that adequate
amount of fresh water might not be obtainable due to the impact of earthquakes and the strategy is to get support from U.S.
military ships to supplement water supply.

Temperature of the reactor pressure vessel of Unit 1 rose to about 400°C which is about 100°C above the designed upper limit in the early
morning of March 23. Temperature was about 197°C at 4:30 pm on March 25. Containment vessel pressure was about 2.8
atmosphere which is rather high, and it is said to be an urgent task to stabilize those figures.

TEPCO announced during the press conference in the night of March 25 that they had detected high level of radioactive intensity which is

0001141

3.8 million Bq/cm^3 from water accumulated on the basement level of Unit 1 turbine building. 1 meter deep water is accumulated
near electric power supply board in the basement of Unit 2 turbine building and dose rate in the surrounding area was 200 to 300 mSv
per hour which is pretty high. Water was found throughout the basement of Unit 4.

NISA of Ministry of Economy, Trade and Industry expressed their view that accumulated water in Unit 3 came from "water inside the reactor
which leaked out into the building for some reasons." There is possibility that the fuel inside the reactor was damaged by high temperature
and radioactive materials leaked out, contaminating water and contaminated water leaked through damaged pipes and valves. Works
have been suspended in the areas where water has been accumulated.

福島原発１、３号機に真水注入　原子炉損傷の可能性

2011/3/25 19:33 (2011/3/26 0:47 更新)

東京電力は福島第１原子力発電所の１、３号機で 25 日午後、原子炉に注入する冷却水を海水から真水に切り替えた。政府は米軍と共同で真水を注入する作戦も始めた。塩分による配管の目詰まりなどを防ぐ。一方、１号機タービン建屋地下の水たまりからは作業員が被曝（ひばく）した３号機と同様運転時の炉心の水に比べ約１万倍の高濃度の放射性物質が検出された。２、４号機でも水たまりがあり冷却機能復旧の妨げになっている。

１号機の冷却水は 25 日午後３時 37 分、３号機は午後６時２分にそれぞれ真水に切り替えた。開通した外部電源を使って直線距離で約 10 キロメートル離れたダムから水を引き、原発敷地内のタンクに入れて消防車のポンプで原子炉に注水している。

タービン建屋地下１階のポンプなどを外部電源で動かして水を入れる計画だったが、危険な作業環境のため当面は消防ポンプを使う。地震の影響でダムから十分な水を得られない可能性もあり、米艦船の力を借りて補給する戦略だ。

１号機の原子炉圧力容器の温度は 23 日未明、設計上の上限を約 100 度上回る約 400 度に上がった 25 日午後４時半も約 197 度あった。格納容器の圧力も約 2.8 気圧と高めで、安定させることが急務という。

東京電力は 25 日夜の記者会見で、１号機のタービン建屋地下１階の水から１立方センチメートルあたり 380 万ベクレルの高濃度の放射性物質を検出したと発表した。２号機のタービン建屋地下でも電源盤付近に最深１メートルの水がたまり、周辺の放射線量は毎時 200～300 ミリシーベルトと高かった。４号機も地下全域に水が出ていた。

経済産業省の原子力安全・保安院は３号機の水たまりは「原子炉の中の水が何らかの原因で建屋に流れた」との見方を示した。炉内の燃料が高温で傷むなどして出た放射性物質が水を汚染し、壊れた配管や弁を通して漏出した可能性がある。水たまりがある場所での作業は中断している。

From: LIA02 Hoc
Sent: Friday, March 25, 2011 11:51 AM
To: Collins, Elmo; Owen, Lucy
Cc: LIA03 Hoc; Carter, Mary; ET02 Hoc
Subject: RE: Checklist for Trip

Need to make sure that your Blackberry will work in Japan and that you get dosimetry and KI from RSO. Believe that if you are on Verizon that your Blackberry will not work in Japan and need a new one for trip.

Steve

From: LIA02 Hoc
Sent: Friday, March 25, 2011 11:40 AM
To: Collins, Elmo; Owen, Lucy
Cc: LIA03 Hoc; Carter, Mary
Subject: Checklist for Trip

Elmo,

Attached is our checklist for trip to Japan. Please use this to make the necessary arrangements for the trip to Japan.

Steve Bloom

0001 142

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: LIA02 Hoc
Sent: Friday, March 25, 2011 10:33 AM
To: RST01 Hoc; Hoc, PMT12; LIA08 Hoc; LIA06 Hoc
Subject: FW: NISA bulletin 52, posted to NISA site at 9:37amEDT

Follow Up Flag: Follow up
Flag Status: Flagged

From: LIA10 Hoc
Sent: Friday, March 25, 2011 10:31 AM
To: LIA02 Hoc; LIA03 Hoc
Subject: NISA bulletin 52, posted to NISA site at 9:37amEDT

Atomic power emergency bulletin

【Report 52】

Effects of Tohoku Pacific Earthquake (March 25, 19:30

[2011/03/25 22:37 updated]

Changes from last report as follows:

1. Employee radiation exposure

Three cooperating company workers who laid cable on March 24 on the 1st floor and in the 1st-level basement of the Unit 3 Turbine Building received confirmed doses of about 170mSv or mor. Two of them had confirmed adhesion of radioactive materials to the skin of their feet-and-or-legs. These two were thought to have possibly suffered beta ray burns and were sent to Fukushima Prefectural Universal Hospital. All three arrived at the National Institute of Radiological Sciences in Chiba prefecture at 16:44 on March 25. None of the three had particular problems as to their bodies overall, and were alert, lucid and ambulant. They are now undergoing tests related to radiation exposure.

The water they stepped in was tested. Dose rate at the surface of the water was about 400mSv/h. Gamma ray nuclide analysis of a water sample showed a total concentration in the sample of about 3.9x106Bq/cm3.

2. Nuclear Power Stations

○Fukushima Daiichi NPS

0002 143

・Began injection of fresh water to Unit 1 RPV (March 25, 15:37)
・Kawasaki Fire Dept., supported by Tokyo Fire Dept., discharged water to Unit 3 (March 25 13:28 to 16:00)
・Began injection of fresh water to Unit 3 (March 25, 18:02)
・Concrete pump truck (50t/h) began discharging water to Unit 4 (March 25, 19:05)
・Switched Unit 6 Residual Heat Removal Seawater System from temporary to main power source (March 25, 15:38、15:42)

原子力関連 緊急情報

【第 52 報】東北地方太平洋沖地震による原子力施設への影響について（25 日 19 時 30 分現在）

[2011/03/25 22:37 更新]

前回からの変更点は以下のとおり。

１．従業員等の被ばく
３月２４日、３号機タービン建屋１階及び地下１階において、ケーブル敷設作業を行っていた作業員３名（全員協力社員）について、約 170mSv 以上の線量を確認し、そのうち２名について、両足の皮膚に放射性物質の付着を確認した。この２名については、ベータ線熱傷の可能性があると判断したことから、福島県立医科大学附属病院へ搬送し、本日２５日１６時４４分に作業員３名とも千葉県にある放射線医学総合研究所に到着した。３名とも全身の状態に特に大きな問題はなく、意識も清明で、歩行も可能であった。現在、被ばく線量等について検査を行っているところ。
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、試料の濃度は各核種合計で約 3.9×106Bq/cm3 であった。
２．原子力発電所関係
○福島第一原子力発電所
・１号機の原子炉圧力容器へ淡水注入開始（２５日 15:37）
・３号機について、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 から 16:00）
・３号機について、原子炉圧力容器へ淡水注入開始（25 日 18:02）
・４号機について、コンクリートポンプ車（50t/h）が放水開始（２５日 19:05）
・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）

From: LIA10 Hoc
Sent: Friday, March 25, 2011 2:53 PM
To: LIA02 Hoc; LIA03 Hoc
Subject: Nikkei article 2011/3/25 22:59
Attachments: image001.jpg; image002.gif; image003.jpg

2011/3/25 21:42 (2011/3/25 22:59 更新)

All-out effort to cool reactors at Fukushima NPS

Switch made to Fresh water

Tepco switched from pouring in seawater to fresh water to the reactors of Units 1 and 3 and Fukushima Daiichi NPS. Continued injection of seawater could result in salt damage, impelling the switch to fresh water. An all-out effort to stably cool the reactors, with cooperation from the U.S. military, is underway, but the way ahead is difficult.

Method for injecting fresh water to reactors

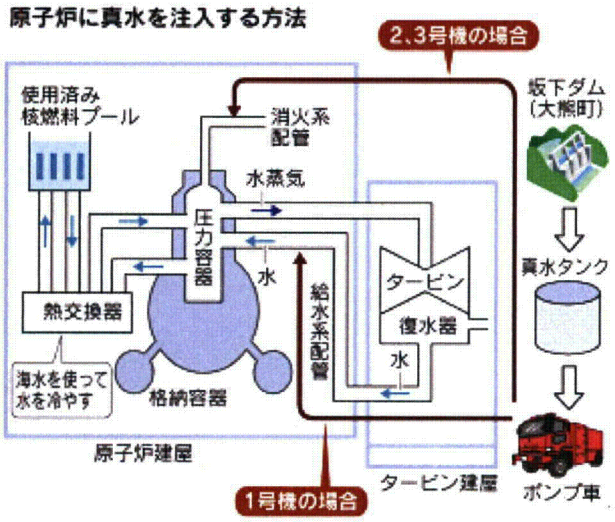
SFP / Fire extinguishing pipe / Sakamoto Dam in Okuma town

Water vapor

Heat exchanger / RPV / water / Water Supply System pipe / Turbine / Condensor / Water / Fresh water tank

Cool water using seawater / containment

Reactor building / Turbine building / pump vehicle



Upper arrow: case of Unit 2 and 3

0001/144

Lower arrow: case of Unit 1

Fresh water previously reserved for household use at Sakamoto Dam (Okuma town, Fukushima prefecture) was sent by tanker and injected with fire truck pumps. Thanks to restoration of external power, it is now possible to extract water from the tank. Unit 2 is to switch on March 26.

An earlier plan was to recover pumps in the Turbine Buildings and use them to pump fresh water, but this was abandoned when workers were irradiated trying to achieve pump recovery. Fresh water was injected by attaching fire truck pumps to the pipes of reactor buildings.

Road outside the security gate of Fukushima Daiichi Units 1 and 2. Hoses injecting seawater to Units 3 and 4 are visible. (NISA photo)

With Unit 1-3 reactor temperatures above 100 degrees, seawater boils and salt concentration is high. Salt imperfectly melted can crystallize, clogging pipes and valves

"Ten days is the limit for injecting seawater to reactors," says Hokkaido Univ. Professor Nara. Beyond that salt can adhere around fuel rods, corroding zircalloy cladding, releasing nuclear fuel. Switching to fresh water, even though there may be salt around the rods, some of it will dissolve in fresh water, avoiding corrosion of cladding.

Tepco, with cooperation from the U.S. military and others, will accelerate injection of fresh water to reactors. Turbine Building pump restoration work, which had been suspended will also resume. If pumps recover, large quantities of fresh water can be injected. Pipes connecting RPVs and turbines and other places can crack, causing injected water to leak; thus, it is unclear as to whether sufficient cooling effects can be obtained.

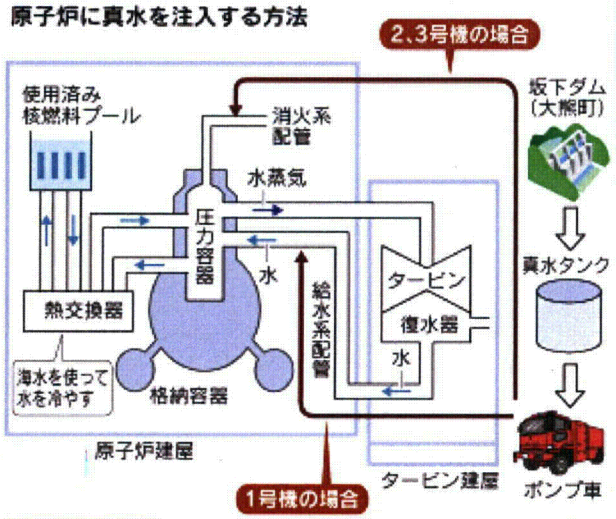
Therefore, it is urgent to recover heat exchangers, which are most effective for cooling reactors, and could achieve cold shutdown below 100 degrees in 2-3 days.

It will take time to recover the heat exchangers, though, since pipes connecting the exchangers and reactors, as well as coolant pumps, may have suffered earthquake damage. In that case, pipes and pumps would be replaced, and electrical checks would follow. The

buildings of Units 1-4 have accumulations of water, making it difficult to approach work areas for fear of irradiation.

福島原発、原子炉冷却へ総力戦　真水注入に切り替え

東京電力福島第１原子力発電所１、３号機で、原子炉に送り込む海水を真水に切り替えた。原子炉に海水を入れ続けると塩分で原子炉に損傷を与える恐れもあり、真水への切り替えが求められていた米軍の協力も得た総力戦で、原子炉の安定的な冷却に向けた作業を急ぐが、道はなお険しい。



画像の拡大

東日本大震災による津波で原子炉に冷却水を送るポンプの非常用発電機が停止したため、東電は12日から消防車のポンプを使って１～３号機の原子炉圧力容器に海水を送り込んでいた。

海水に代わって送り込んだ真水は、生活用水に使っていた坂下ダム（福島県大熊町）の水をタンクに送った後、消防車のポンプで注入した。いずれも外部電源を接続できたため、タンクから水を取り出せるようになった。２号機は26日にも切り替える。

■海水は緊急措置

当初はタービン建屋にあるポンプを復旧して真水に切り替える計画だった。ただ、ポンプの復旧を進めていた作業員が被曝（ひばく）し断念。消防車のポンプを原子炉建屋の配管につなぐ方法で真水を送り込んだ。

海水から真水への切り替えを急いだ理由は、海水に約3.5%含まれる塩分が原子炉に様々な悪影響を与えるからだ。本来、原子炉に入れる水は不純物を除いた真水。海水を使ったのは、地震によって大量の真水が手に入らず、過熱した原子炉を冷やすための緊急措置だった。

塩分に含まれる塩素には、金属を腐食させる性質がある。「塩素は原発では禁物だ」と奈良林直・北海道大学教授は指摘する。福島第１原発では配管に帯状のひび割れが見つかったことがある。海水に含まれる塩素が長時間かけて配管を腐食させたという。

画像の拡大

福島第１原発１、２号機のセキュリティーゲートの外にある道路。３、４号機に海水を注水するホースが延びている（23 日）＝原子力安全・保安院提供

海水中の塩分が固まる可能性もある。１～３号機の原子炉内はセ氏 100 度を超え、海水が沸騰して塩分の濃度が高い。溶けきれなくなった塩分が結晶となり配管をふさいだり弁が動かなくなったりする可能性もある。

「海水を原子炉に入れ続けるのは 10 日間が限界だ」と奈良林教授。10 日間原子炉に塩がたまり続けると、燃料棒の周りに塩分が付着し、放射性物質を包むジルコニウム合金製の被覆管が腐食して中身の核燃料が出る危険がある。真水に切り替えれば燃料棒の周りに塩分がたまっていても一部が真水に溶け出し、被覆管の腐食は避けられる。

■水たまりが障害に

東電などは今後、米軍の協力も得ながら、原子炉へ送り込む真水の注入を加速する。いったん中断していたタービン建屋にあるポンプの復旧作業も進める。ポンプが回復すれば、大量の真水を送り込めるようになる。ただ、圧力容器からタービンなどにつながる配管に亀裂が入り注入した真水が漏れている可能性もあり、十分な冷却効果が得られるかは不明だ。

そのため、原子炉の冷却にとって最も効果が高い熱交換器の復旧を急ぐ。熱交換器は原子炉の内部を通った水の熱を、海水を介して冷却する装置。冷却効果が高く、これが正常に動けば、原子炉が 100 度以下に冷える「冷温停止」という安全な状態に、２～３日でもっていけるという。

ただ、熱交換器の復旧には時間がかかる可能性もある。地震の揺れなどで原子炉と熱交換器をつなぐ配管や冷却水を送るポンプなどが壊れたかもしれないからだ。もし壊れていた場合は配管やポンプを交換したうえで、電気系統の確認などが必要になる。１～４号機の建屋には放射性物質を含む水たまりがある。復旧作業では被曝する恐れもあり、容易には現場に近づけない。復旧はなお難航が予想される。

From: LIA02 Hoc
Sent: Friday, March 25, 2011 6:45 PM
To: PMT01 Hoc; PMT02 Hoc; RST01 Hoc
Cc: LIA03 Hoc
Subject: FW: TEPCO Earthquake Information Update on March 25: Fukushima-Daiichi Status
Attachments: image001.jpg

Hope this helpful

From: Hidehiko Yamachika [mailto:yamachika-hidehiko@jnes-usa.org]
Sent: Friday, March 25, 2011 6:19 PM
To: LIA02 Hoc
Subject: FW: TEPCO Earthquake Information Update on March 25: Fukushima-Daiichi 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: Friday, March 25, 2011 5:48 PM
To: matsuo.kenji@tepco.co.jp
Subject: TEPCO Earthquake Information Update on March 25: Fukushima-Daiichi Status

Dear Friends,
Please see updates at Fukushima-Daiichi NPS.

(1) Result of the investigation on exposure to radiation of workers
(2) High radiation water may come from the unit 3 reactor, not spent fuel pool
(3) Status of water injection to the pool.

Contacts:
TEPCO Washington Office :202-457-0790
Kenji Matsuo, Director and General Manager
Yuichi Nagano, Deputy General Manager,
Masayuki Yamamoto, Manager, Nuclear Power Programs

145

(1) Result of the investigation on highly radiated workers

Bellow are the investigation results of their working environment. Radiation dose rate of surface of the water is approximately 400mSv/h.

Result of gamma-ray nuclide analyses based on sampling of puddle

location	Puddle in underground floor of turbine building of Unit 3
Name of nuclide	Concentration of sample(Bq/cm^3)
Cobalt60	Approximately 7.0×10^2
Technetium99m	Approximately 2.5×10^3
Iodine131	Approximately 1.2×10^5
Cesium134	Approximately 1.8×10^5
Cesium136	Approximately 2.3×10^4
Cesium137	Approximately 1.8×10^5
Barium140	Approximately 5.2×10^4
Lanthanum140	Approximately 9.4×10^3
Cerium144	Approximately 2.2×10^5
total	Approximately 3.9×10^5

We are assessing radiation dose of 2 worker's leg skin by beta ray. This incident would be caused because the workers regarded radiation dose of working area as low from survey result of radiation dose on March 23, it was about 0.5 mSv/hr at 5:00 and no major water puddle there. Workers continued working without recognizing change of work environment although their APD were alarming during the work

TEPCO has thoroughly instructed its employees and contractor workers to pay attention to the alarm of their APD and evacuate when necessary.

Regarding this event, Fukushima Labor Bureau gave TEPCO verbal instructions. After summerising lessons learned and future measures to this event, TEPCO will report related government ministries and agencies to make sure radiation control thoroughly.

(2)High radiation water may come from the unit 3 reactor, not spent fuel pool

As for the leakage of radioactive materials at Unit 3 turbine building, we assume the water came from the reactor. We collected sample of the contaminated water in the turbine building of Unit 3 and conducted the gamma-emitting nuclide analysis. We confirmed the following nuclides with short half-life.

Nuclides half-life (days) density (bq/cubic centimeter)

Iodine 131	08.06	1.2 x 10E6
Cesium 136	13.16	2.3 x 10E4
Balium 140	12.75	5.2 x 10E4

There are 148 fuel rods with less than one year of cooling period in the spent fuel pool at Unit 3. Those fuel rods were transferred to the spent fuel pool between Jun 23 and 28, 2010 having had more than 200 days of cooling period. Nuclides with short half-life had sufficient time for decay in the spent fuel pool, so it seems possible that the contaminated water in the turbine building is from the reactor.

We do not deny possibility that there might be certain damage to the reactor of Unit 3. Even should that be the case, as plant parameters such as the reactor pressure and D/W pressure is stable , we presume that RPV is not seriously damaged.

We are injecting seawater and from the night of March 25, fresh water into the reactor. The water turns into steam and comes out from the reactor vessel through the SRV, then depressurized at the suppression chamber and condensed to water. This flow of water is cooling the reactor. Having experienced fluctuations of temperature and pressure, the containment function might be loosened somewhere. In any event, the above is a possibility, not yet confirmed.

(3) Water injection into the pools and the reactors

Unit 1: Sea water injection into the reactor pressure vessel, from 3:37 pm on March 25th, we have started to inject fresh water into it.

Unit 2: From 10:30 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System (FPC) was started. This finished at 0:19 pm.

Unit 3 From 5:35 am on March 24th, seawater injection through Fuel Pool Cooling and Filtering System (FPC) was started and finished at 4:05 pm.

Spraying at the spent fuel pool by Kawasaki City Fire Department was carried out from 1:28 pm to 4:00 pm on March 25th.

Unit 4: From 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 (FPC) was started and finished at 10:20 am.

From: LIA02 Hoc
Sent: Friday, March 25, 2011 9:42 AM
To: 'ShafferMR@state.gov'
Cc: LIA03 Hoc
Subject: FW:
Attachments: 03-25-11 0430 RST Assessment Document.docx

Mark,

This is one of the three things I owe you.

Steve

From: RST01 Hoc
Sent: Friday, March 25, 2011 9:38 AM
To: LIA02 Hoc
Subject: RE:

I think this is what they want...

From: LIA02 Hoc
Sent: Friday, March 25, 2011 8:52 AM
To: RST01 Hoc
Cc: LIA03 Hoc
Subject:

RST,

We are trying to keep Ambassador Davies in Vienna up to date and therefore it is requested that you please provide the **set of recommendations pertaining to severe accident management strategies which you gave to the NRC** team in Japan. The recommendations were coordinated with GEH, EPRI, INPO, Naval Reactors, and DOE. I will then forward.

Thank you,

Steve

From: LIA02 Hoc
Sent: Saturday, March 26, 2011 12:28 PM
To: Vietti-Cook, Annette; LIA03 Hoc
Cc: LIA06 Hoc
Subject: RE: Deputies Committee Meeting Summaries

Annette,

Thank you very much. Please include LIA02 and LIA03 on future CCs

Steve

From: Vietti-Cook, Annette
Sent: Saturday, March 26, 2011 12:22 PM
To: LIA03 Hoc
Cc: LIA06 Hoc; LIA02 Hoc
Subject: RE: Deputies Committee Meeting Summaries

I have just sent you everything I have from the 1st Deputies meeting on morning of March 11 which NRC did not participate in, and then all subsequent ones in which NRC did participate. Sometimes I get the agenda before the meeting and forwarded those to. I will continue to include you in future distribution when they are received. I am in a hurry and it was easier to forward everything and you can figure out what you have and don't have.

From: LIA03 Hoc
Sent: Saturday, March 26, 2011 3:36 AM
To: Vietti-Cook, Annette
Cc: LIA06 Hoc; LIA02 Hoc
Subject: Deputies Committee Meeting Summaries

Dear Ms. Vietti-Cook,

I understand that you are on the distribution list for the National Security Staff's Deputies Committee meeting summary reports. A number of those reports were forwarded to LIA06 in the operations center (attached is a list of what we have received). Several dates have not been received, and we were wondering if it is because no meeting(s) had been held on those dates; no report(s) had been issued; or if the reports simply hadn't yet been sent to us. We have been asked to access these reports which contain information about decisions and action items, some of which pertain to the NRC, so it is important for us to have all of them.

Could you please go through the list and send us any missing reports that you may have? If you believe that no meetings were held on the "missing" dates, please also let us know.

Many thanks,
Elizabeth Smiroldo
International Liaison Team

Deputies Committee Meeting Summaries

Date	Time	Did a meeting take place?	Is summary available?	Is participant list available?
11-Mar	7:30	Yes	Yes	Yes
11-Mar	17:30	Yes	Yes	Yes
12-Mar	11:00	Yes	Yes	Yes
13-Mar				
14-Mar	8:00	Yes	Yes	Yes
15-Mar	8:00	Yes	Yes	Yes
16-Mar				
17-Mar				
18-Mar	8:00	Yes	Yes	Yes
19-Mar				
20-Mar				
21-Mar				
22-Mar				
23-Mar	8:00	Yes	Yes	Yes
24-Mar				
25-Mar				
26-Mar				
27-Mar				
28-Mar				

From: LIA06 Hoc
Sent: Saturday, March 26, 2011 1:40 AM
To: LIA03 Hoc
Subject: Action: NSS Deputies Meeting Summaries
Attachments: FW: eWASH WH 0146; FW: EWASH WH0143; FW: eWASH WH0142; FW: eWash Message; FW: eWash Message; FW: eWash Message; FW: eWash Message; FW: eWASH WH0131; FW: eWash Message; FW: eWash Message; FW: eWash Message; FW: eWash: WH 124; FW: eWASH-WH0116; FW: eWASH-WH0117; FW: eWASH-WH0118; FW: FYI - WH 104; FW: FYI - WH 104; Fw: eWASH WH 0146; FW: FYI - WH 104

Please catalogue and save to M:\LT\White House. Use consistent naming for each file, including date and time of meeting.

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

0001/148

From: PMT09 Hoc
Sent: Saturday, March 26, 2011 6:10 AM
To: Hoc, PMT12; ET07 Hoc
Subject: FW: Major Dose Assessments
Attachments: Major dose assessment matrix.xlsx

NARAC Source Term summary

From: PMT02 Hoc
Sent: Saturday, March 26, 2011 6:05 AM
To: PMT09 Hoc
Cc: FOIA Response.hoc Resource
Subject: Major Dose Assessments

PMT Dose Analyst (PMT02)
NRC Operation Center

0001149

Fuel Melt (FM) and containment release (%/Day) assumed

From: LIA10 Hoc
Sent: Saturday, March 26, 2011 4:55 AM
To: LIA02 Hoc; LIA03 Hoc
Subject: Nikkei article re pipe damages possible
Attachments: Nikkei article 3-26 re pipe damages.doc

0001/150

Source: Nikkei 2011/3/26 10:11 (2011/3/26 13:03Revised)

Possibility of Damages on Pipes
Fukushima NPP, Iodine Found in Seawater

In relation to the issue that highly concentrated radioactive materials were detected in the basement water of Reactor no. 1 and 3 turbine buildings, a new possibility is emerged - the pipes were damaged and radioactive materials leaked from them. The Nuclear and Industrial Safety Agency (NISA) finds it difficult to assume that these materials were leaked from the spent fuel pool judging from the degree of concentration. Also, on the 26th, TEPCO announced that highly concentrated radioactive materials were detected in the seawater near Reactor No.1. It is assumed that they were discharged from this NPP.

On the 24th, workers were exposed radiation getting wet in the water of Reactor no. 3's turbine building. This water was contaminated by Iodine 131 and other radioactive materials. Contaminated water was also found in the turbine building of Reactor no. 1.

The NISA studied the type and concentration of these materials and the state of the reactor. The agency stated, "The pressure and containment vessels that house fuel rods are intact and it is difficult to think that they are leaked from the spent fuel pool". There is a possibility that the fuel rods in the reactor was damaged and released radioactive materials and contaminated water was discharged through pipes and valves.

In this NPP, water was also found in the turbine buildings in Reactor no. 2 and 4. On the 26th, TEPCO has been trying in a hurry to get rid of the contaminated water in Reactor no. 1.

Damaged pipes and valves cause problems in circulating cooling water for reactor. The source areas of leaking require repairs or replacements but working on them is not easy due to high radioactivity at the site. It still appears to take a long time to reach the safe state called, "Cold temperature shutdown".

On the 26th, TEPCO also announced that they had detected highly concentrated radioactive materials in sampled seawater taken 330 meters south of discharging area of the NPP on the 25th. The concentration level of Iodide 131 was 50 Bq per 1 cubic cm, some 1250 times more than the limit set by government authority.

This concentration level is the highest since the start of monitoring of radioactive materials in seawater on the 21st. TEPCO explained this saying, “There is a possibility that contaminated water gets discharged (from the NPP’s compound)” to the ocean.

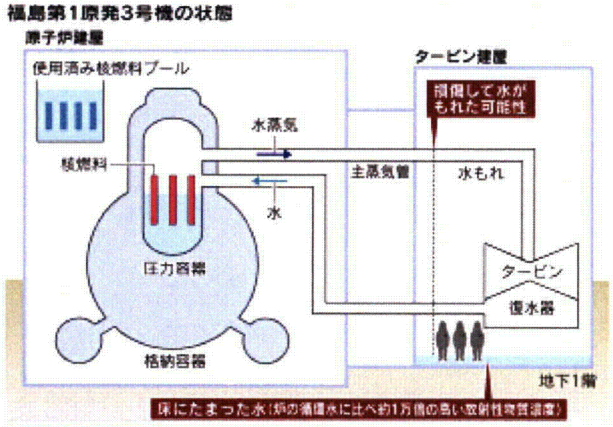
Meanwhile, TEPCO on the 26th switched from seawater to fresh water for injection to Reactor no.2. According to the NISA, it is planned that fresh water will be used as well for cooling the spend fuel pool of Reactor no. 1-4 on the 27th.

Since the 25th, fresh water has been injected to Reactor no. 1 and 3, and once the plan for the 27th is implemented, fresh water will be used for all cooling purposes. This will help prevent from clogging and corrosion of the pipes caused by the use of seawater.

2011/3/26 10:11 (2011/3/26 13:03 更新)

小
中
大
印刷

東京電力福島第１原子力発電所の１、３号機のタービン建屋地下の水たまりから高濃度の放射性物質が検出された問題で、原子炉につながる配管などが損傷し放射性物質が漏れた可能性が出てきた。経済産業省原子力安全・保安院は放射性物質の濃度などから使用済み核燃料プールから漏れたとは考えにくいとみている。また東電は 26 日、第１原発近くの海水から高濃度の放射性物質を検出したと発表。同原発から漏れ出したとみられる。



画像の拡大

第１原発では 24 日、３号機のタービン建屋で作業員が水にぬれて被曝（ひばく）。水は放射性物質のヨウ素 131 などに汚染されていた。１号機のタービン建屋でも汚染水が確認された。

保安院は放射性物質の種類や濃度、原子炉の状態を検討。「燃料棒が入っている圧力容器や格納容器は健全で、使用済み核燃料プールから漏れ出たとは考えにくい」とみている。原子炉内の燃料棒が損傷して放射性物質を放出し、汚染水が配管や弁を通して漏れ出した可能性がある。

同原発では２、４号機でもタービン建屋で水が発生。東電は 26 日、１号機で除去作業を進めるなど汚染水の封じ込めを急いでいる。

配管や弁に損傷がある場合、原子炉を冷やす冷却水の循環に支障が生じる。漏出部分の修理や不良な弁の交換などが必要となるが、現場は放射線量が高く作業は容易でない。「冷温停止」という安全な状態に持ち込むには、なお時間がかかりそうだ。

また東電は 26 日、同原発の放水口から南側 330 メートルの海域で 25 日午前に採取した海水から高濃度の放射性物質を検出したと発表した。ヨウ素 131 の濃度は国が定めた濃度限度の約 1250 倍に相当する１立方センチメートルあたり 50 ベクレルだった。

海水中の放射性物質の調査が始まった 21 日以降で最も高い値となる。東電は「（原発敷地内から）汚染された水が海に出ている可能性がある」と説明している。

一方、東電は 26 日から２号機でも原子炉への注水を海水から真水に切り替えた。保安院によると 27 日には１～４号機の使用済み核燃料プールの冷却水も真水に切り替える予定。

１、３号機の原子炉では 25 日に真水の注入を始めており、これで全ての冷却水を真水に置き換えることになる。海水の塩分による配管詰まりや腐食といった副作用を防げるようになる。

From: PMT09 Hoc
Sent: Saturday, March 26, 2011 5:10 PM
To: Hoc, PMT12
Subject: FW: Major Dose Assessments
Attachments: Major dose assessment matrix.xlsx

Keep in your files....

From: PMT02 Hoc
Sent: Saturday, March 26, 2011 6:05 AM
To: PMT09 Hoc
Cc: FOIA Response.hoc Resource
Subject: Major Dose Assessments

PMT Dose Analyst (PMT02)
NRC Operation Center

0001 151

Fuel Melt (FM) and containment release (%/Day) assumed

From: LIA02 Hoc
Sent: Saturday, March 26, 2011 7:35 AM
To: Foggie, Kirk; Smith, Brooke
Cc: LIA03 Hoc
Subject: Watchstanders

Lance English and Steve Bloom are on watch

0001152

From: Uhle, Jennifer
Sent: Saturday, March 26, 2011 7:00 AM
To: ET07 Hoc
Attachments: chairman brief on SAMGs.docx

QQQ/153

A list of suggested actions was developed in collaboration with INPO, GE-Hitachi, Naval Reactors (NR), EPRI, DOE and NRC that pertain to severe accident management strategies. The organizations have agreed to a version of this document, dated and we provided it to Chuck Casto. The actions were based on the long-established severe accident management guidelines of a U.S. plant similar to Fukushima.

Over the course of the day, we do expect to make additional changes to the document to improve the technical content. We expect to obtain concurrence from our partners and transmit the document to Chuck Casto later today.

The suggested actions are informed by our current understanding of plant conditions at Fukushima. These conditions are dynamic and our information is unconfirmed in light of the unavailability of working instrumentation.

NRC and our U.S. partners are concerned about the conditions in Unit 1 regarding the potential for hydrogen burn. The suggested actions do not address hydrogen in great detail. U.S. severe accident management guidelines assume the option to inert the containment with nitrogen to preclude hydrogen burn is available. This tactic is not currently available at Fukushima. As a result, the staff is going to continue to evaluate the hydrogen issue in consultation with some consultants with the required expertise, such as Dana Powers at Sandia National Laboratory.

If an accident were to occur in the U.S., the NRC would remain abreast of conditions in the plant and raise concerns to the licensee if we noted that a licensee was taking inappropriate actions. We would escalate up to and including an order if warranted.

The original course of action was to provide these suggested actions to TEPCo and obtain feedback regarding the validity of our assumed plant conditions. Thereafter, the site team would then explain our suggested actions and determine whether TEPCo was taking these actions or if not, determine their planned actions and rationale. We believe this interactive dialogue would be more effective at encouraging these actions and determining TEPCo's overall strategy to place the plants in a stable state.

From: ET07 Hoc
Sent: Saturday, March 26, 2011 12:49 PM
To: LIA07 Hoc
Subject: RE: Has anyone seen Chuck Casto's notes from the daily cabinet meeting?

Yep, that's it. Thanks.

From: LIA07 Hoc
Sent: Saturday, March 26, 2011 12:30 PM
To: ET07 Hoc; LIA01 Hoc; LIA11 Hoc; RST01 Hoc; OST01 HOC
Cc: FOIA Response.hoc Resource
Subject: RE: Has anyone seen Chuck Casto's notes from the daily cabinet meeting?

See attachment. Is this what you are looking for?

From: ET07 Hoc
Sent: Saturday, March 26, 2011 12:26 PM
To: LIA01 Hoc; LIA07 Hoc; LIA11 Hoc; RST01 Hoc; OST01 HOC
Cc: FOIA Response.hoc Resource
Subject: Has anyone seen Chuck Casto's notes from the daily cabinet meeting?

The notes he would have sent in this morning his time – that would have been yesterday evening our time.

QQQ/154

From: LIA06 Hoc
Sent: Saturday, March 26, 2011 8:41 PM
To: Snodderly, Michael
Cc: LIA08 Hoc; LIA03 Hoc; LIA01 Hoc
Subject: IAEA website

Mike,

We were able to access to the IAEA website IAEA.org/programe/a2. There is a link to "registered users" that does require a user name and password. I this the source of information the Commissioner was attempting to access?

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

QQQ/155

From: RST01 Hoc
Sent: Saturday, March 26, 2011 6:36 PM
To: Boyce, Tom (RES)
Subject: FW: powerpoint on Japan
Attachments: NISA.Status AllUnits..1203.1200. 6pp.en20110323-3-2.pdf; NISA. Sequence and status. 2303.21pp.en20110323-3-1.pdf; Fukuchima_eng_20110320.pps

Tom:

The slide show is an excellent chronology of events. It may be good for the Tuesday Meeting.

Mark Orr

From: McMurtray, Anthony
Sent: Saturday, March 26, 2011 6:32 PM
To: RST01 Hoc
Subject: FW: powerpoint on Japan

fyi. Please get this to members of the RST team, especially the Fukuchima eng file (Powerpoint presentation of event from AREVA). This info. was sent to my staff from ASME.

Tony McMurtray

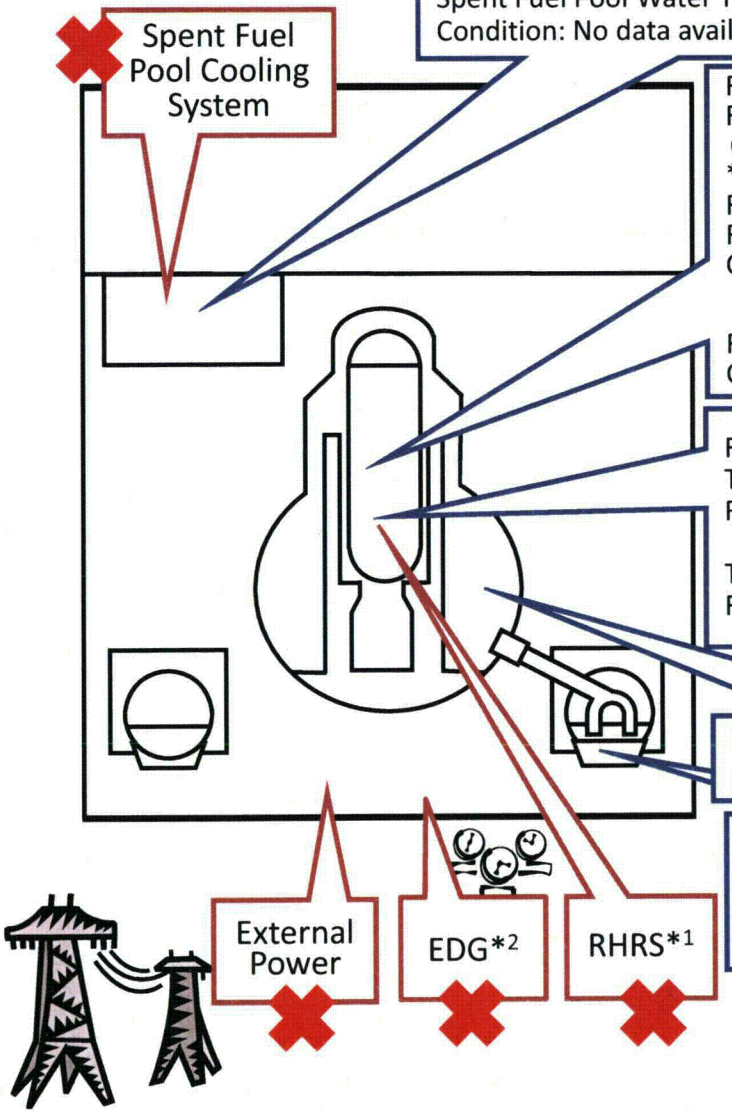
From: Orenak, Michael
Sent: Friday, March 25, 2011 2:59 PM
To: Bedi, Gurjendra; Billerbeck, John; Farnan, Michael; Huang, John; McMurtray, Anthony; Wolfgang, Robert
Subject: powerpoint on Japan

I just received this from the Symposium session chairs. Check out the interesting powerpoint presentation if you have time.

From: Robert Horvath [mailto:HorvathR@asme.org]
Sent: Friday, March 25, 2011 2:32 PM
To: jeallen@IEIAForum.org; Robert_Parry@fpl.com; Orenak, Michael; john.zudans@ch2m.com; Robert.Kershaw@aps.com
Cc: Claude Thibault
Subject:

0004/156

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 1
(As of 12:00 March 23rd, 2011)



Spent Fuel Pool Water Temperature — ℃
Condition: No data available

Reactor Pressure A 0.457MPa*
Reactor Pressure B 0.420MPa*
Condition : No large fluctuation
*converted to absolute pressure
Reactor Water Level A −1,750mm
Reactor Water Level B −1,750mm
Condition: No flooding of top of active fuel until the above level

Reactor Water Temperature —
Condition: No data available

Reactor Pressure Vessel (RPV) Temperature:
Feedwater Nozzle Temperature :345 ℃
Temperature at the bottom head of RPV :350 ℃

PCV*3 Pressure 0.320MPa
Condition: No large fluctuation

S/P*4 Water Temperature — ℃
Condition : No data available
S/P*4 Pressure 0.300Pa
Condition : No large fluctuation

Major Events after the earthquake

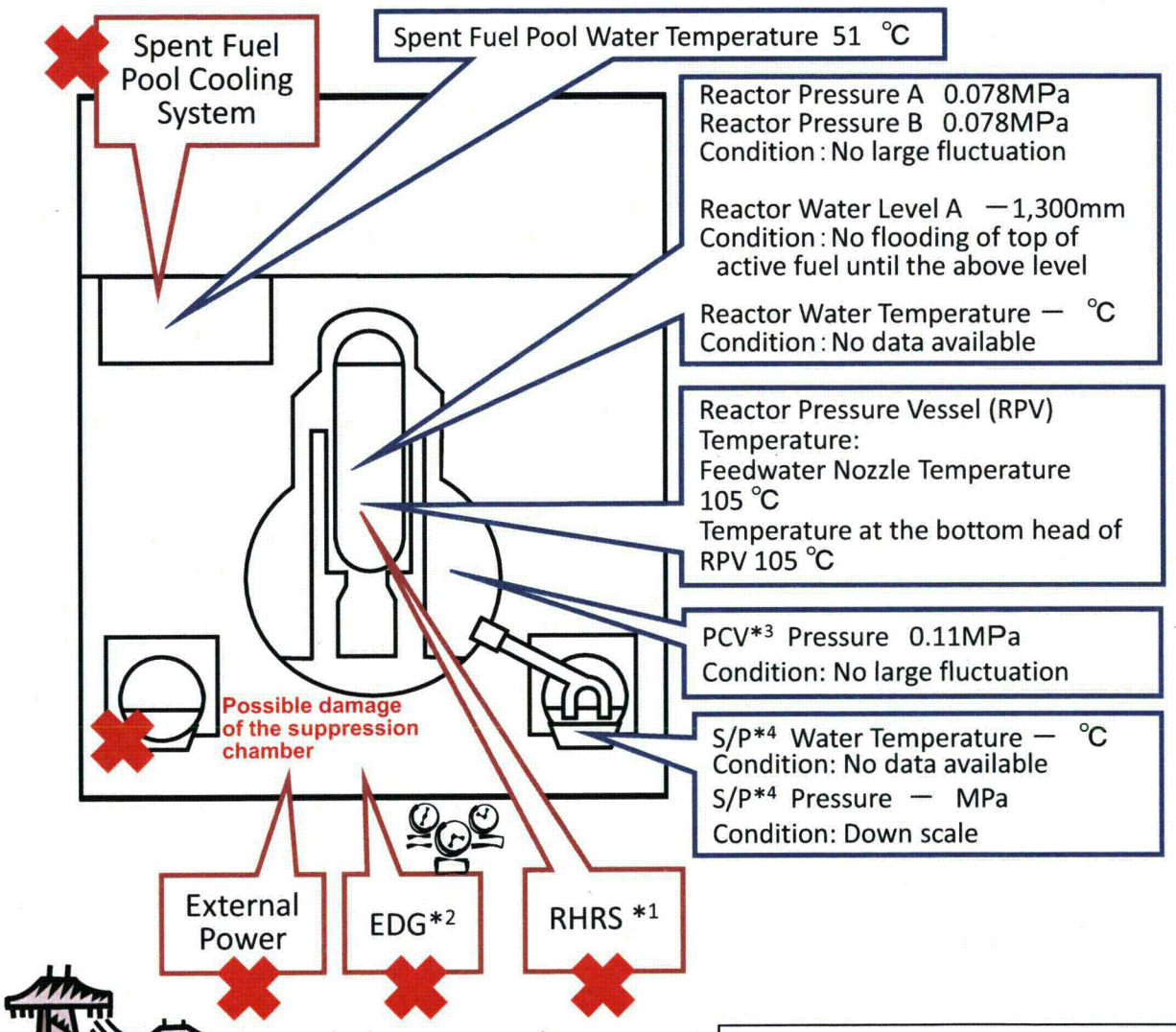
- 11th 14:46 : Under operation, Automatic shutdown by the earthquake
- 11th 15:42 : Report based on the Article 10 (Total loss of A/C power)
- 11th 16:36: Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
- 12th 1:20 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV)
- 12th 14:30 Started to vent
- 12th 15:36 Sound of explosion
- 12th 20:20 Started to inject seawater and borated water to core
- 23rd 02:33 The amount of injected water to the Rector Core was increased utilizing water supply line in addition to the Fire Extinguish line ($2m^3/h \rightarrow 18m^3/h$)

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

Current Conditions : Seawater is being injected to the core

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 2
(As of 12:00 March 23rd, 2011)



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

Major Events after the earthquake

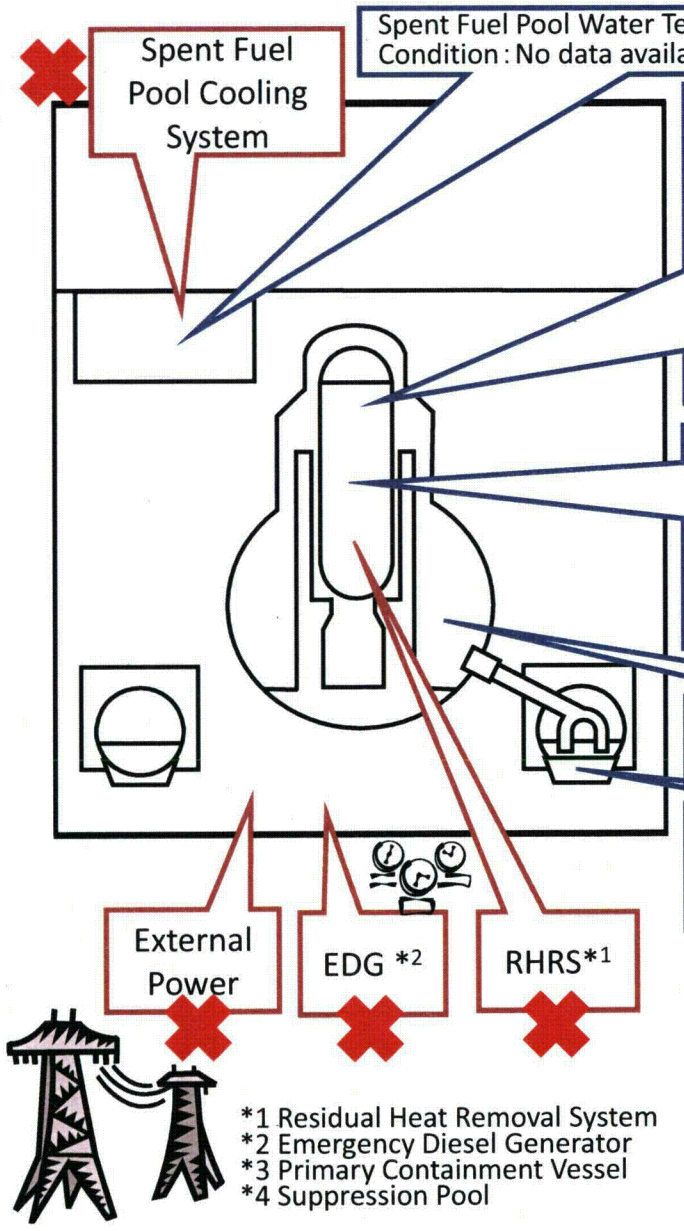
- 11th 14:46 Under operation, Automatic shutdown by the earthquake
- 11th 15:42 Report based on the Article 10 (Total loss of A/C power)
- 11th 16:36 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
- 14th 13:25 Occurrence of the Article 15 event (Loss of reactor cooling functions)
- 14th 22:50 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV)
- 15th 6:10 Sound of explosion
- 15th around 6:20 Possible damage of the suppression chamber
- 20th 15:05～17:20 Approximately 40 ton seawater injection to the Spent Fuel Pool (SFP) via Fuel Pool Cooling System (FPC)
- 20th 15:46 Power Center received electricity.
- 21st 18:22 White smoke generated. The smoke died down and almost invisible.
- 22nd 16:07 Injection of around 18 tons of seawater to the Spent Fuel Pool

Current Conditions : Seawater is being injected to the core

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 3

(As of 12:00 March 23rd, 2011)



Spent Fuel Pool Water Temperature — ℃
Condition : No data available

Reactor Pressure C -0.003MPa
Reactor Pressure A 0.135MPa
Condition : Tend to decrease

Reactor Water Level A —1,800mm
Reactor Water Level B —2,300mm
Condition : No flooding of top of active fuel until the above level

Reactor Water Temperature — ℃
Condition : No data available

Reactor Pressure Vessel (RPV) Temperature
Feedwater Nozzle Temperature : 304.8℃
Temperature at the bottom head of RPV :225.5℃

PCV*3 Pressure 0.100MPa
Condition: No large fluctuation

S/P*4 Water Temperature — ℃
Condition : No data available
S/P*4 Pressure — MPa
Condition: Down scale

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

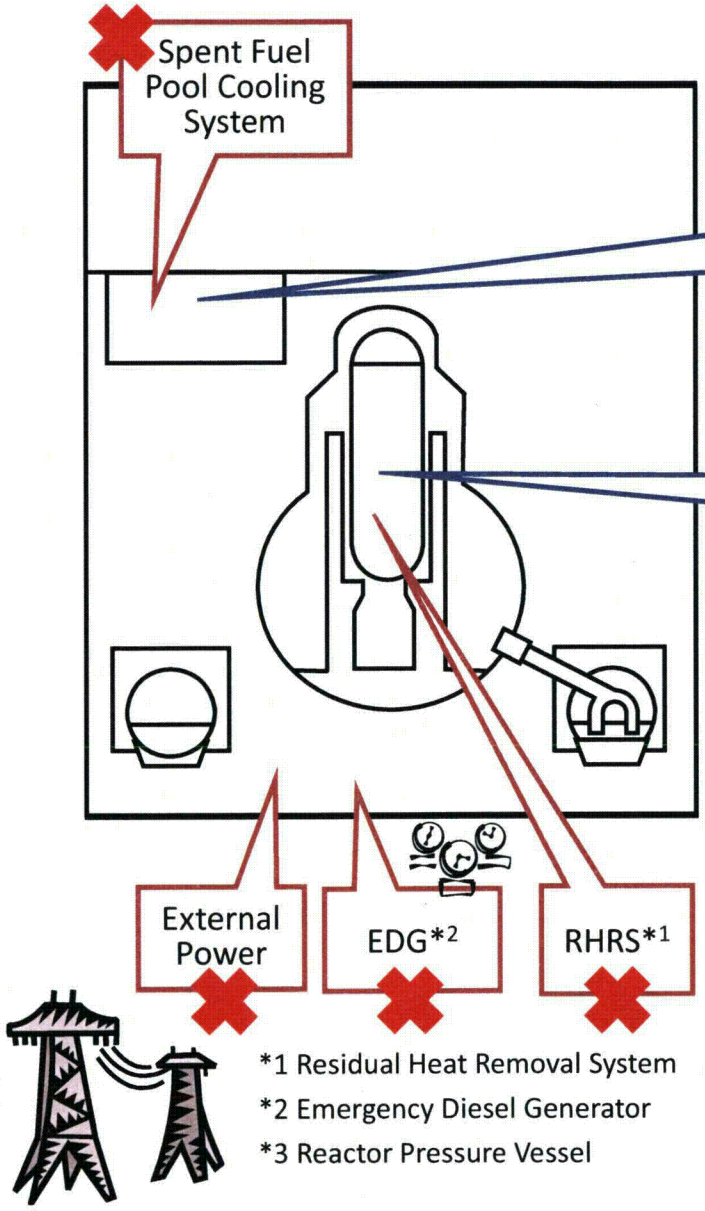
Major Events after the earthquake

11th 14:46 Under operation, Automatic shutdown by the earthquake
11th 5:42 Report based on the Article 10 (Total loss of A/C power)
13th 5:10 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
13th 9:20 Started to vent
14th 7:44 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV)
14th 11:01 Sound of explosion
16th around 8:30 White smoke generated.
17th 9:48～10:01 Water discharge by the helicopters of Self-Defense Force (4 times)
19:05～20:07 Water spray from the ground by High pressure water-cannon trucks (Police: once, Self-Defense Force: 5 times)
18th before 14:00～14:38 Water spray from the ground by 6 fire engines of Self-Defense Force
~14:45 Water spray from the ground by a fire engine of the US Military
19th 0:00 ～01:00 Water spray by Tokyo Fire Department
19th 14:10 ～ 20th 3:40 Water spray by Tokyo Fire Department
20th 11:00 Pressure of PCV rose(320kPa).Afterward fell.
20th 20:39 ～ 21st 3:58 Water spray by Tokyo Fire Department
21st about 15:55 Grayish smoke generated and was confirmed to be died down at 17:55.
22nd 15:10 ～15:59 Water spray by Tokyo Fire Department
22nd 22:43 Lightening in the Central Control Room was recovered.

Current Conditions : Water spray to Spent Fuel Pool and sea water injection to the Reactor Core

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 4
(As of 12:00 March 23rd, 2011)



In periodic inspection outage

Water temperature in the pools is not available

No fuel is inside the reactor core

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

Major events after the earthquake

In periodic inspection outage when the earthquake occurred.
11th 15:42 Report based on the Article 10 (Total loss of A/C power)
14th 4:08 Water temperature in the Spent Fuel Pool, 84℃
15th 6:14 Damage of wall in the 4th floor confirmed
15th 9:38 Fire occurred in the 3rd floor. (12:25 extinguished)
16th 5:45 Fire occurred. TEPCO couldn't confirm any fire on the ground. (6:15)
20th 9:43 Water spray over the Spent Fuel Pool by Self-Defense Force
20th around 18:30~19:46 Water spray over the Spent Fuel Pool by Self-Defense Force
21st 6:37~8:41 Water spray over the Spent Fuel Pool by Self-Defense Force
21st about 15:00 Work for laying cable to Power Center was completed.
22nd 10:35 Power Center received electricity
22nd 17:17～20:32 Water spray by Concrete Pump Track
23rd 10:00～ Water spray by Concrete Pump Track

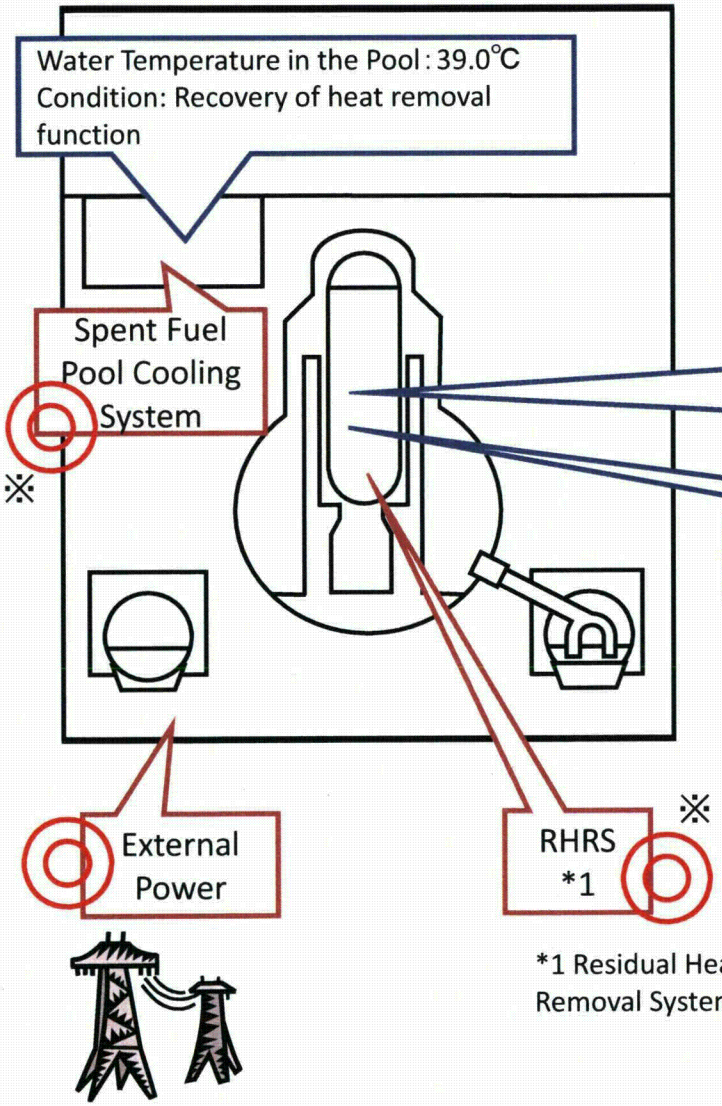
Current Conditions：No fuel is in RPV*3. Water was evaluated to remain in the Pool（by TEPCO）

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 5
(As of 12:00 March 23rd, 2011)

In periodic inspection outage

Current Conditions:
Cold shutdown at 14:30 March 20th.
Receiving electricity from external power supply from 11:36 March 21st.



Reactor Pressure: 0.108MPa*
Reactor Water Level: 1.744mm
Reactor Water Temperature: 30.7℃
Condition: Pressure is under control.
*converted to absolute pressure

Reactor Pressure Vessel Temperature:
Monitoring by Rector Water Temperature

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

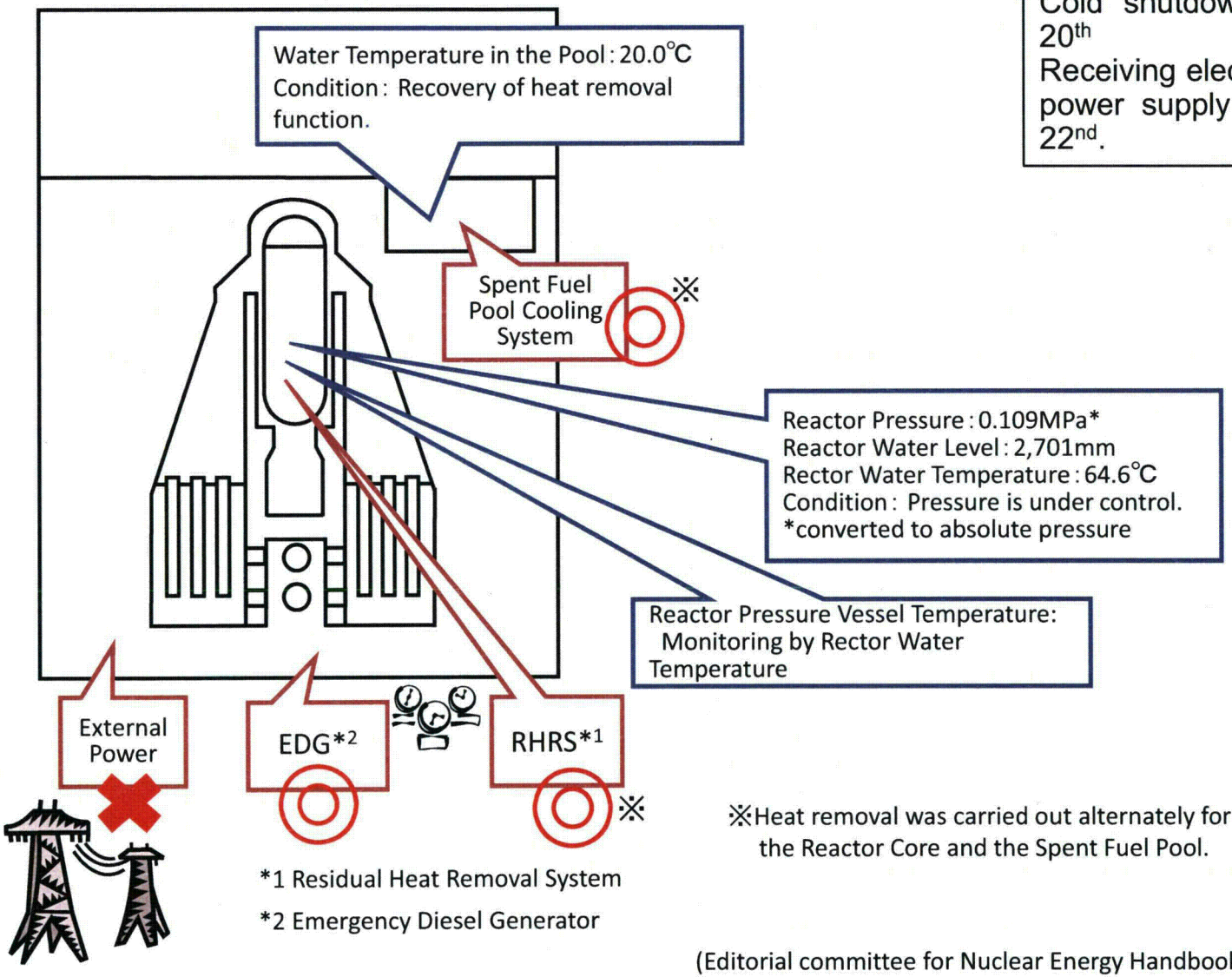
*1 Residual Heat Removal System

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 6
(As of 12:00 March 23rd, 2011)

In periodic inspection outage

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

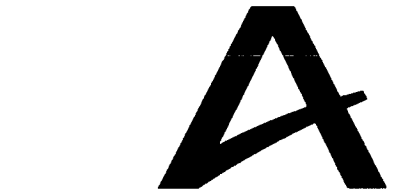


*1 Residual Heat Removal System

*2 Emergency Diesel Generator

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

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



AREVA

The Fukushima Daiichi Incident

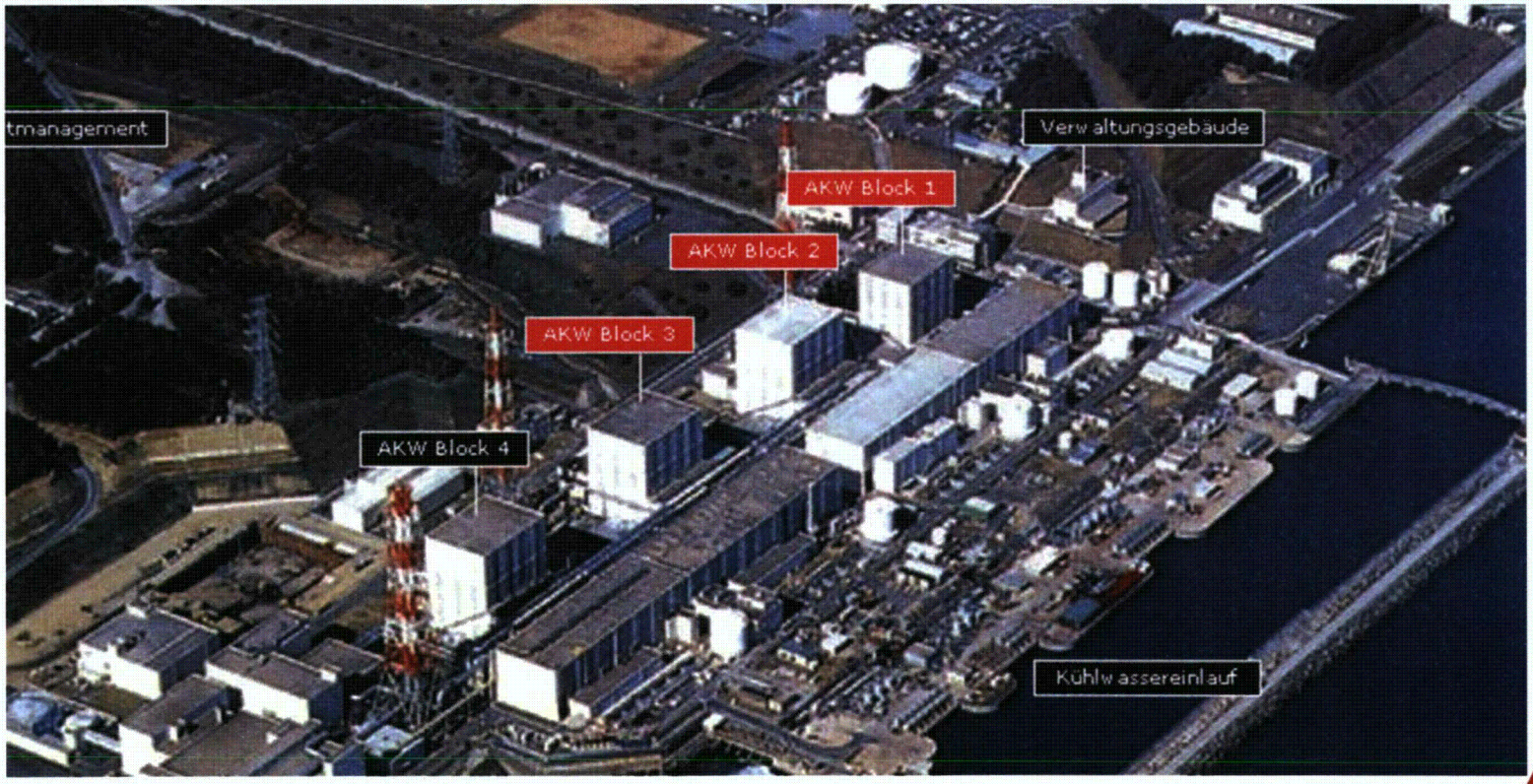
1. Plant Design
2. Accident Progression
3. Radiological releases
4. Spent fuel pools
5. Sources of Information

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

AREVA

The Fukushima Daiichi Incident
1. Plant Design

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

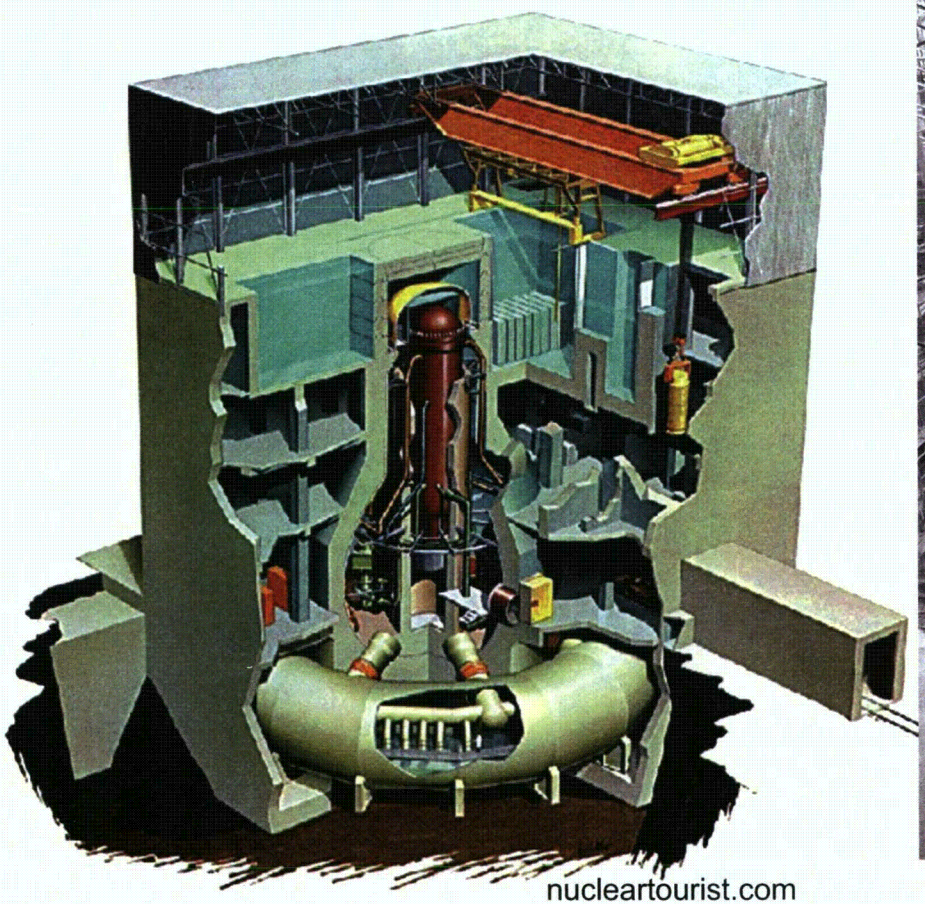


AREVA

The Fukushima Daiichi Incident

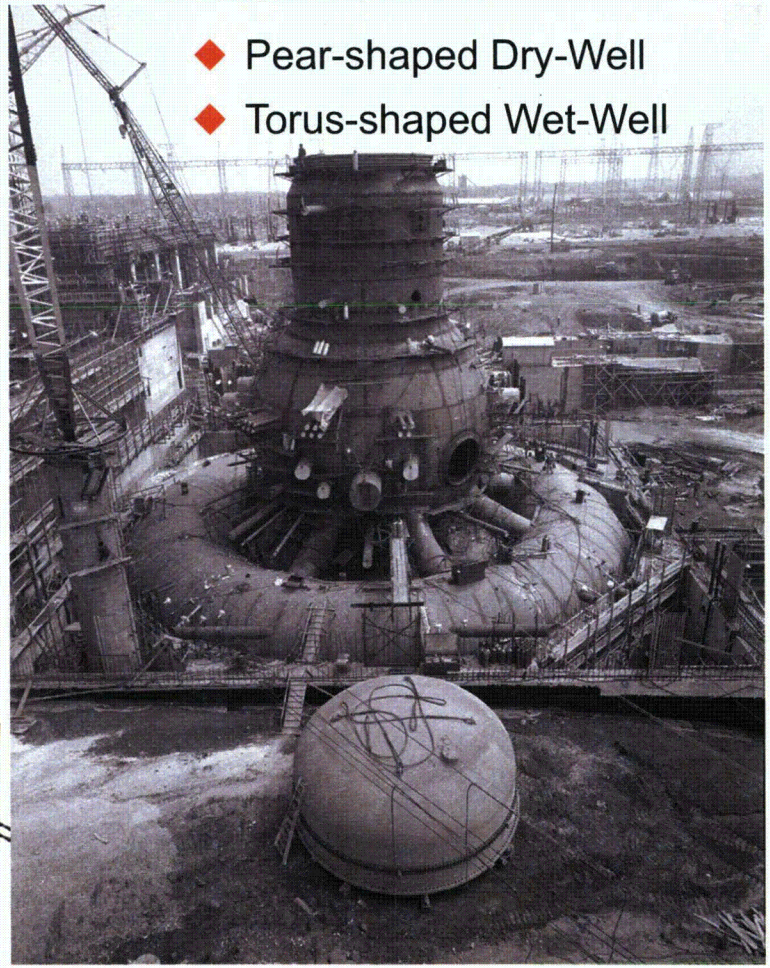
1. Plant Design

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



nucleartourist.com

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

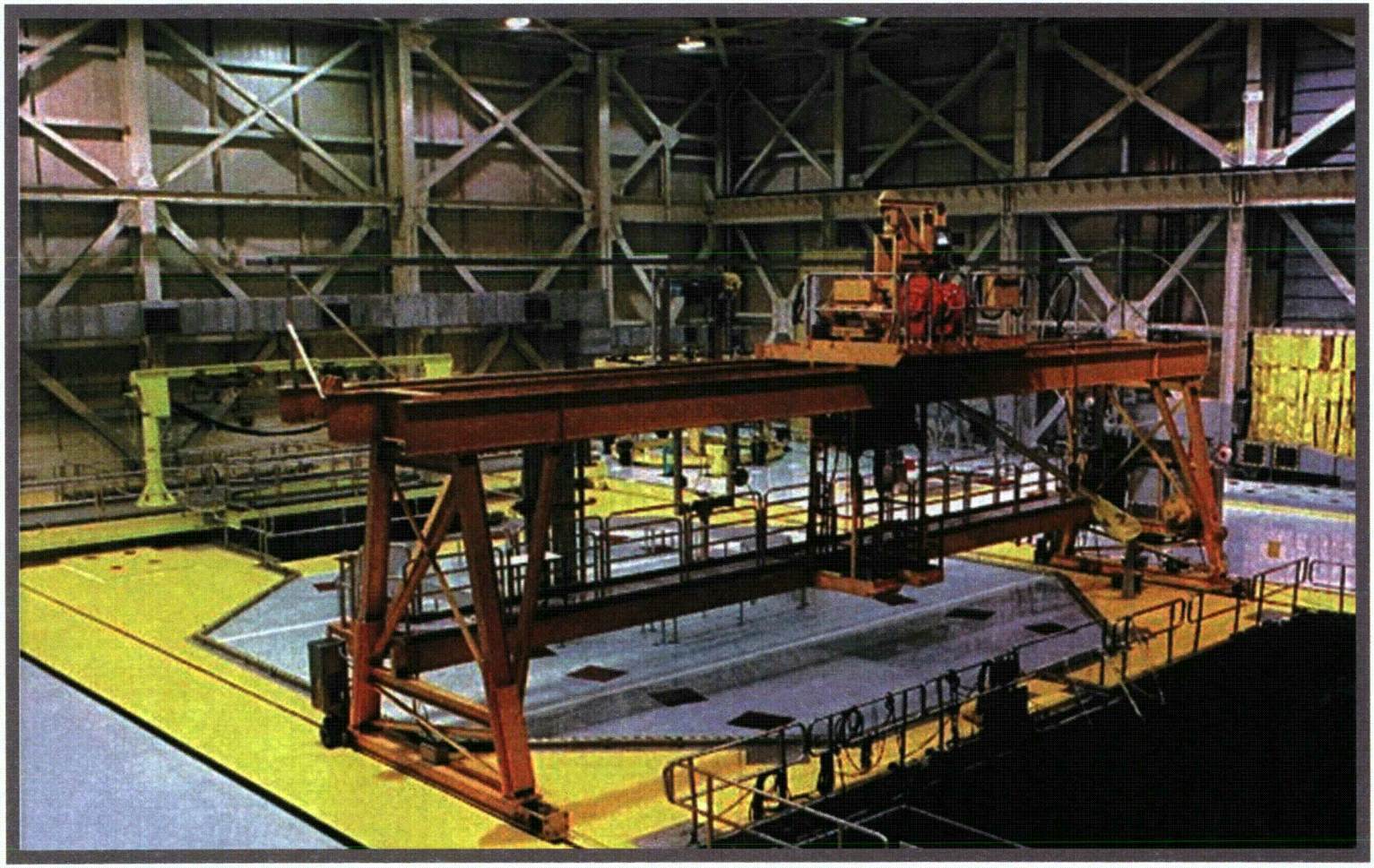


en.wikipedia.org/wiki/Browns_Ferry_Nuclear_Power_Plant

AREVA

The Fukushima Daiichi Incident
1. Plant Design

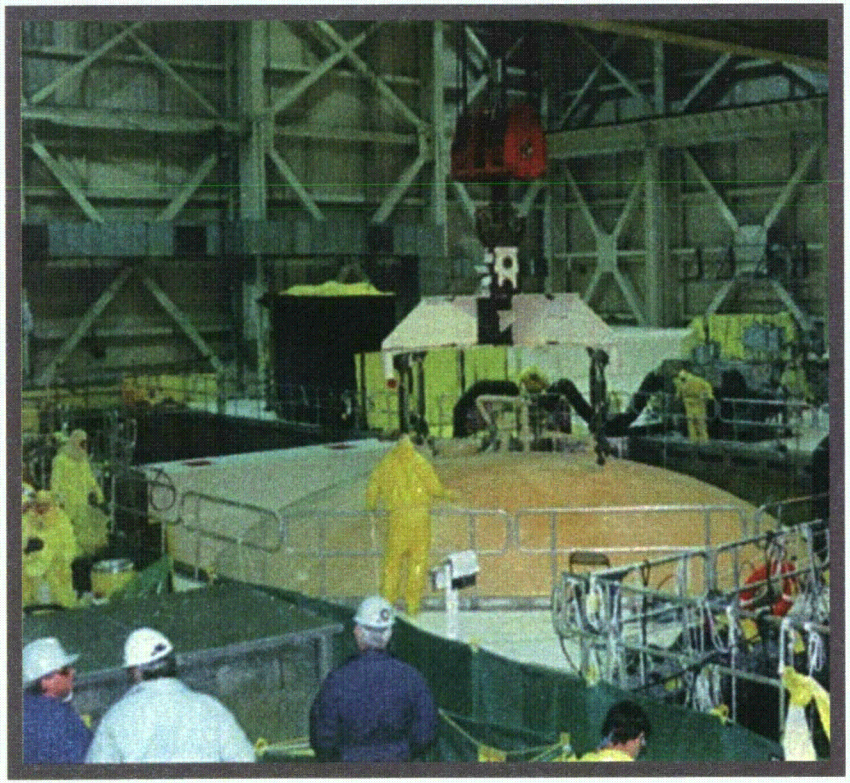
- Service Floor

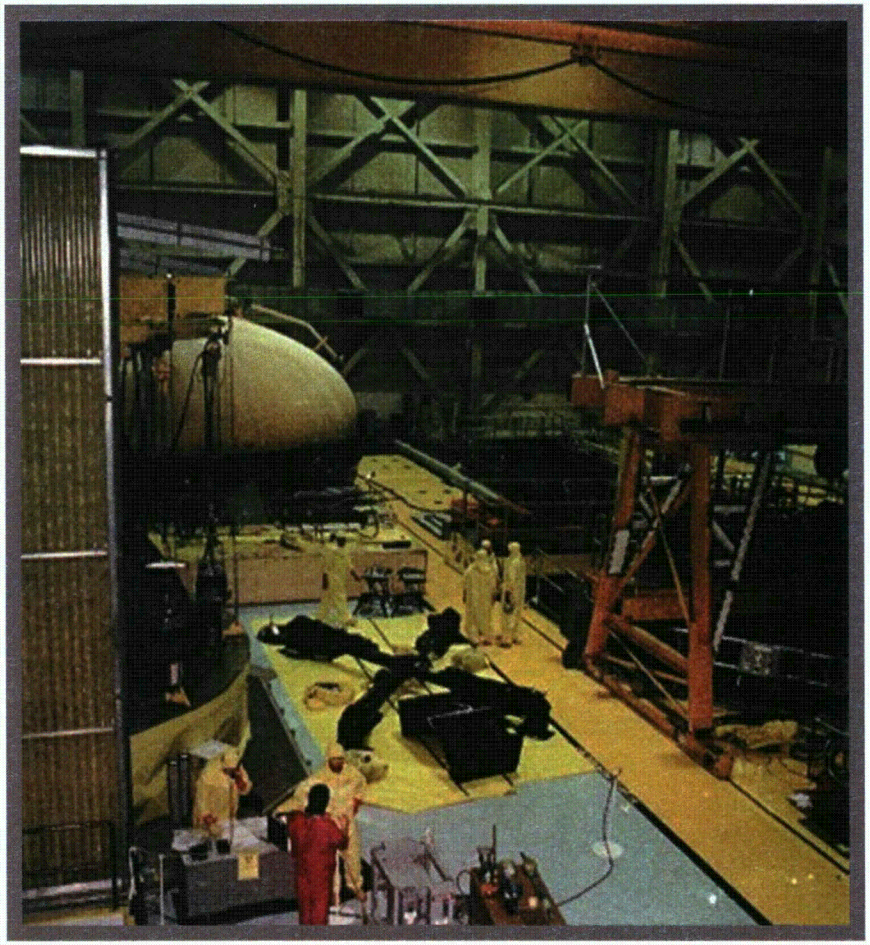


AREVA

The Fukushima Daiichi Incident
1. Plant Design

- Lifting the Containment closure head



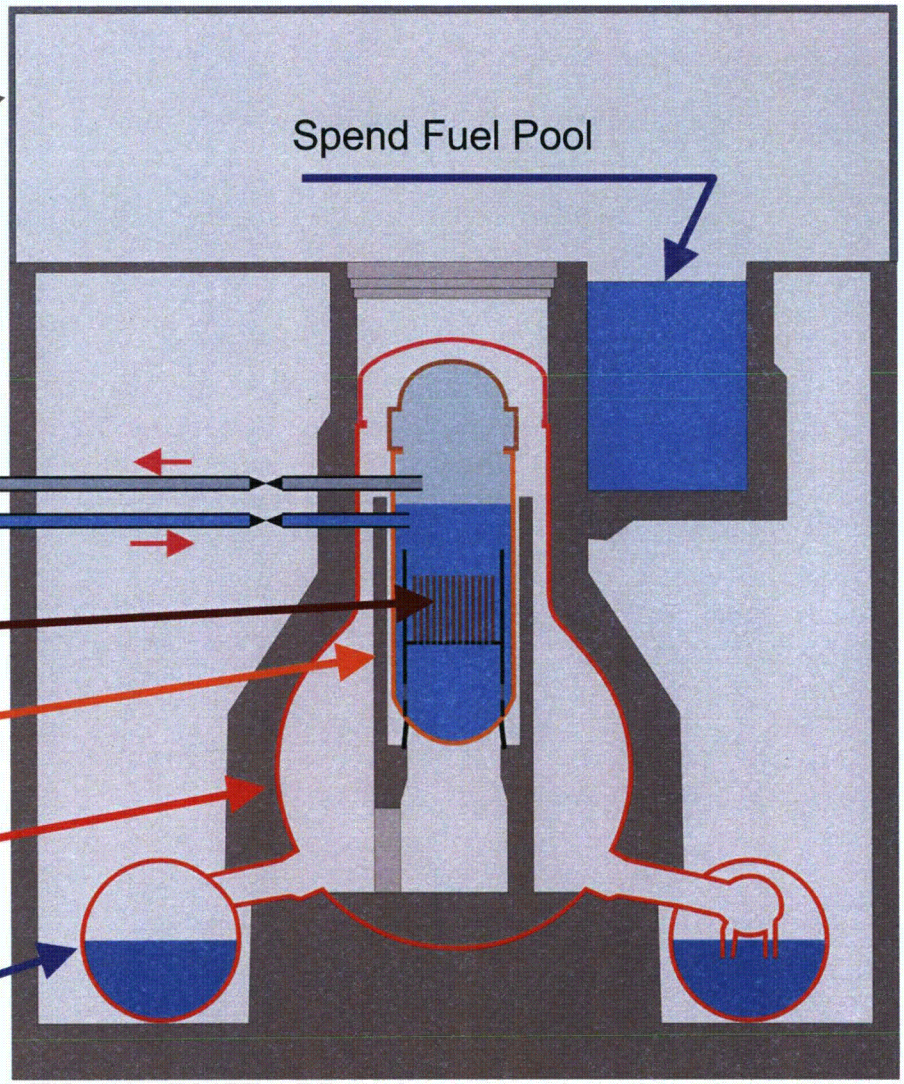


AREVA

The Fukushima Daiichi Incident

1. Plant Design

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

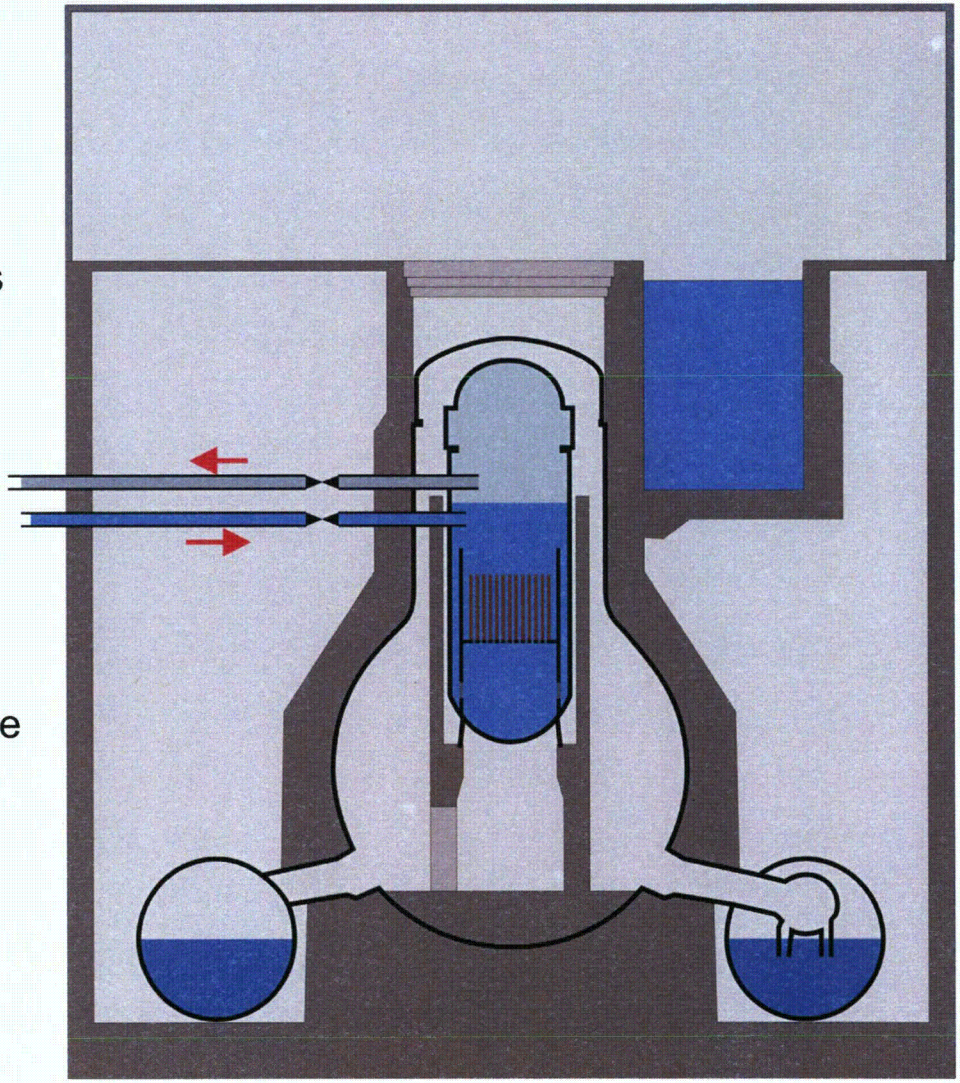


AREVA

The Fukushima Daiichi Incident

2. Accident progression

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

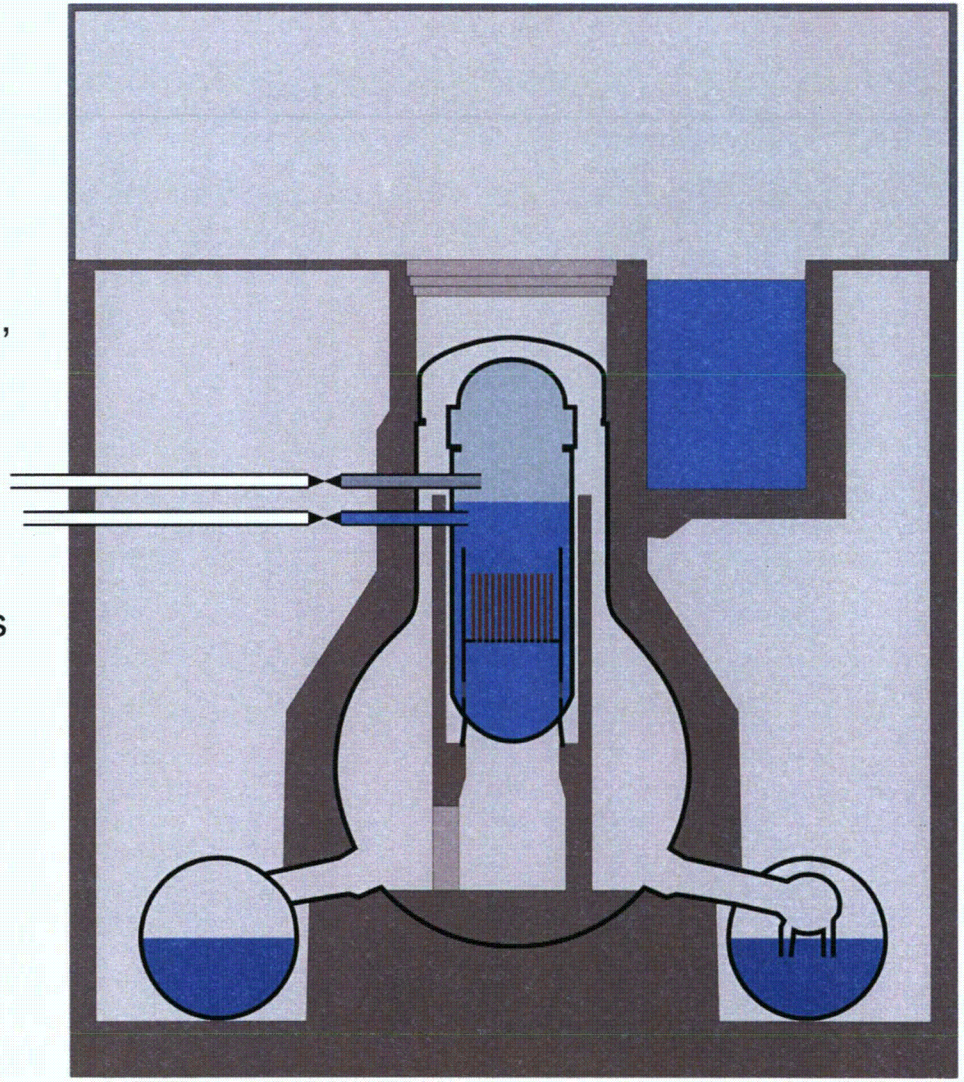


AREVA

The Fukushima Daiichi Incident

2. Accident progression

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

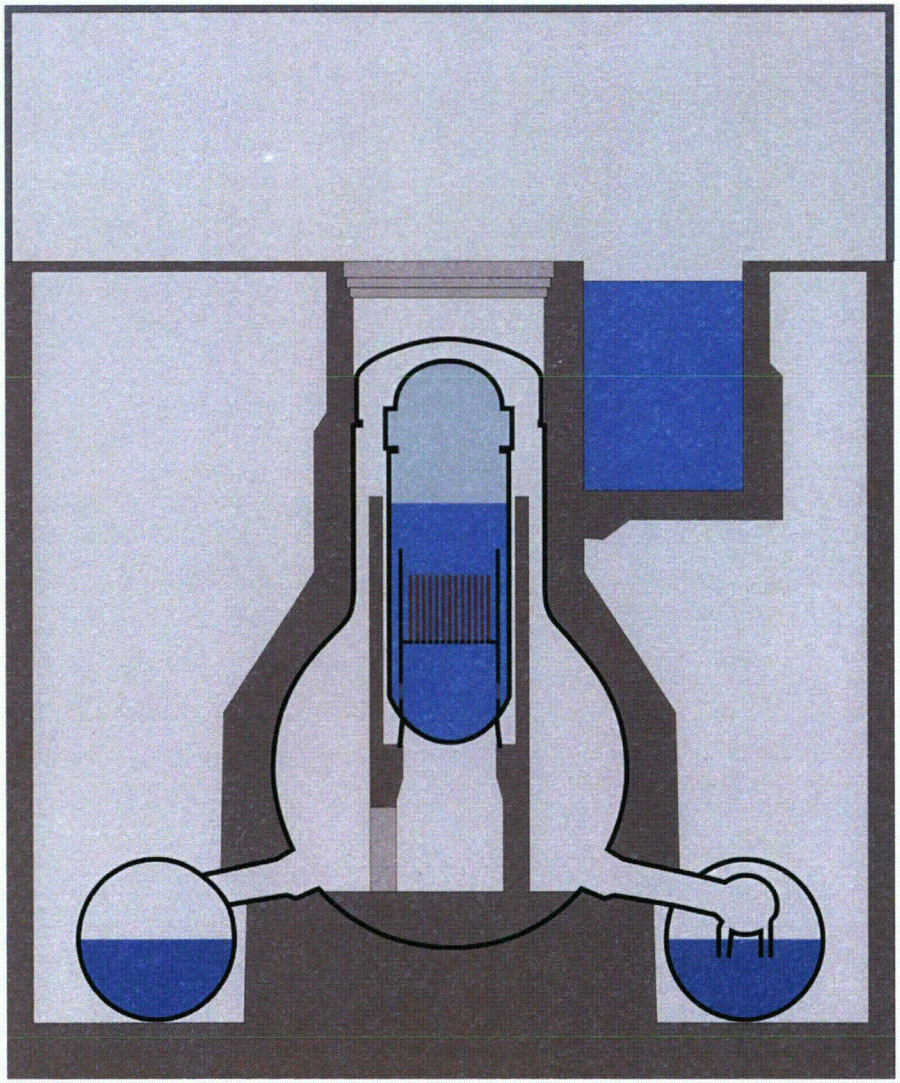


AREVA

The Fukushima Daiichi Incident

2. Accident progression

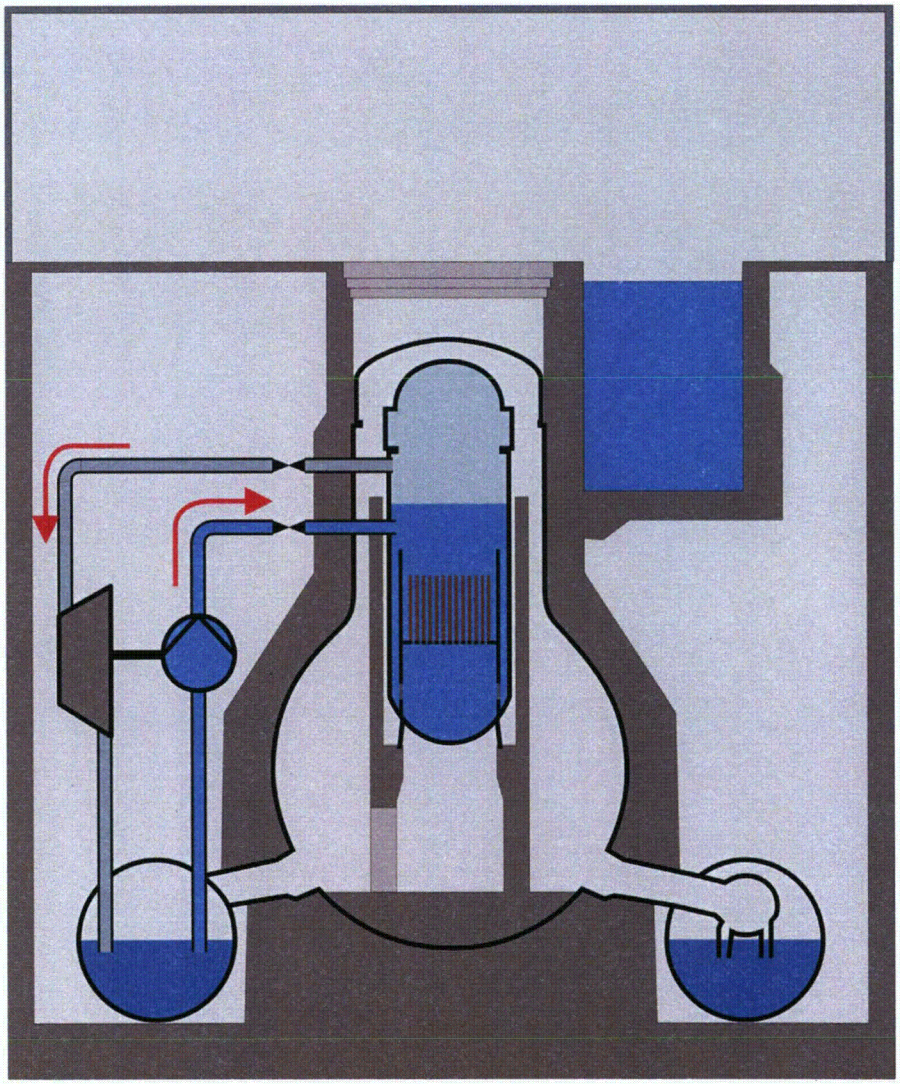
- 11.3. 15:41 Tsunami hits the plant
  - Plant Design for Tsunami height of up to 6.5m
  - Actual Tsunami height >7m
  - Flooding of
    - Diesel Generators and/or
    - Essential service water building cooling the generators
- Station Blackout
  - Common cause failure of the power supply
  - Only Batteries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



The Fukushima Daiichi Incident

2. Accident progression

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

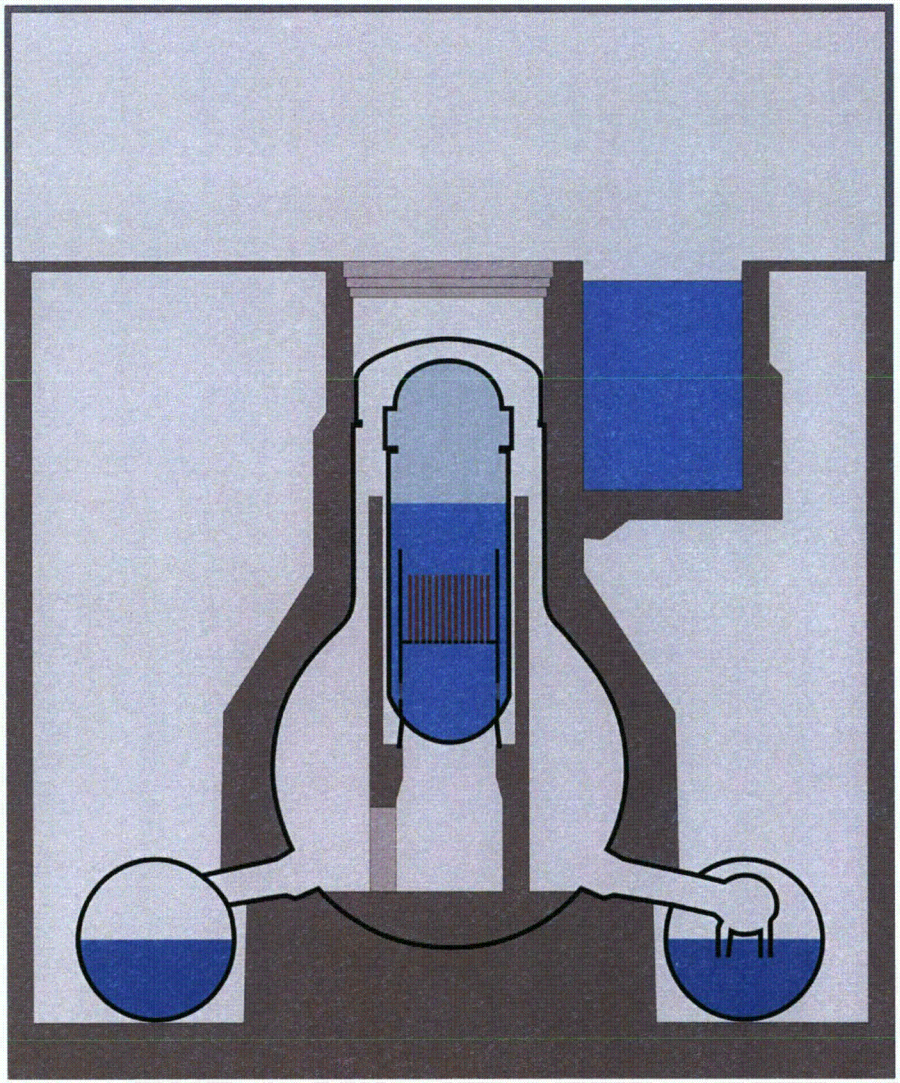


AREVA

The Fukushima Daiichi Incident

2. Accident progression

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



The Fukushima Daiichi Incident

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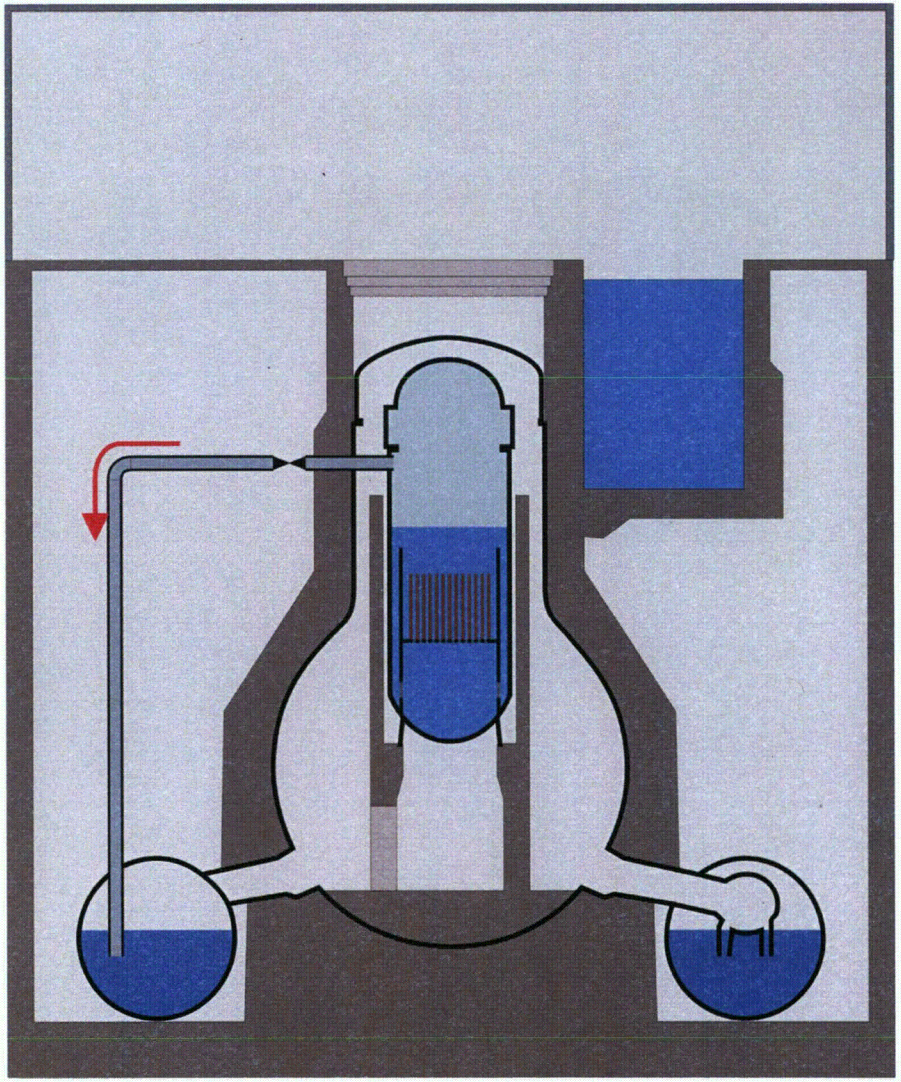

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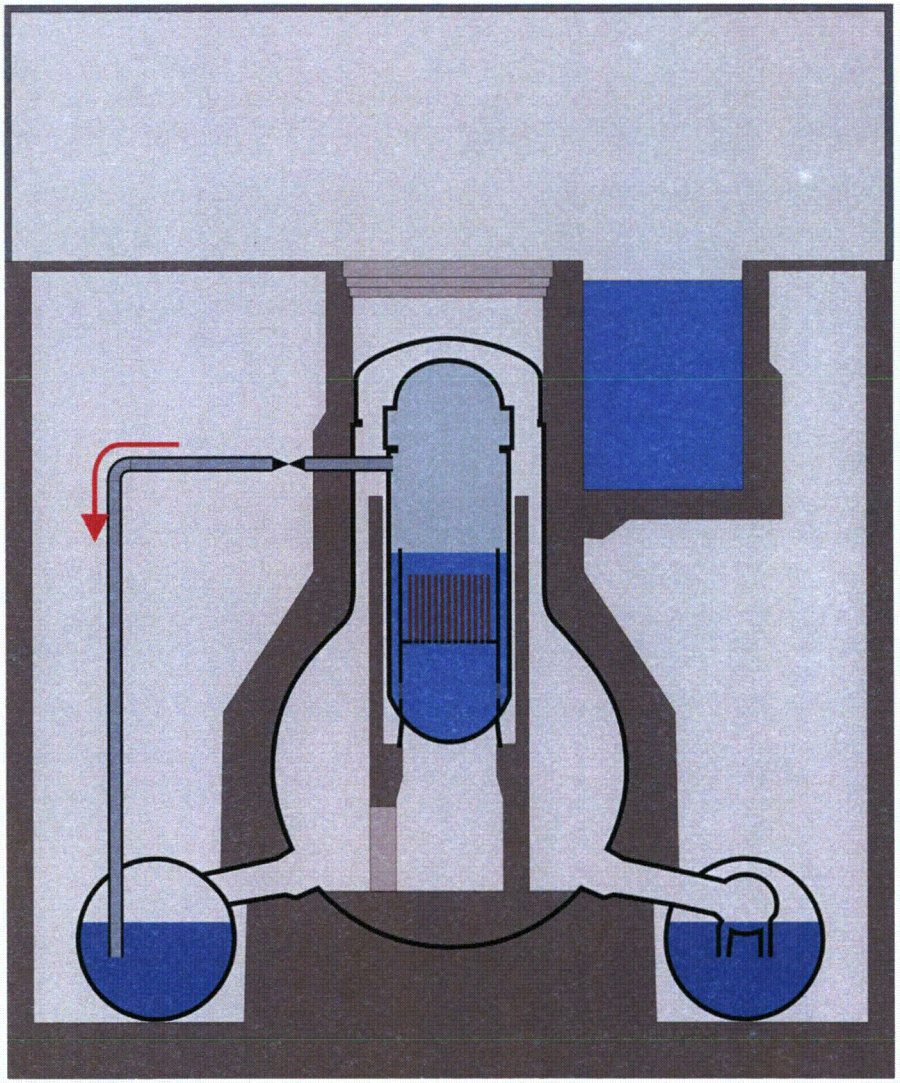

The Fukushima Daiichi Incident

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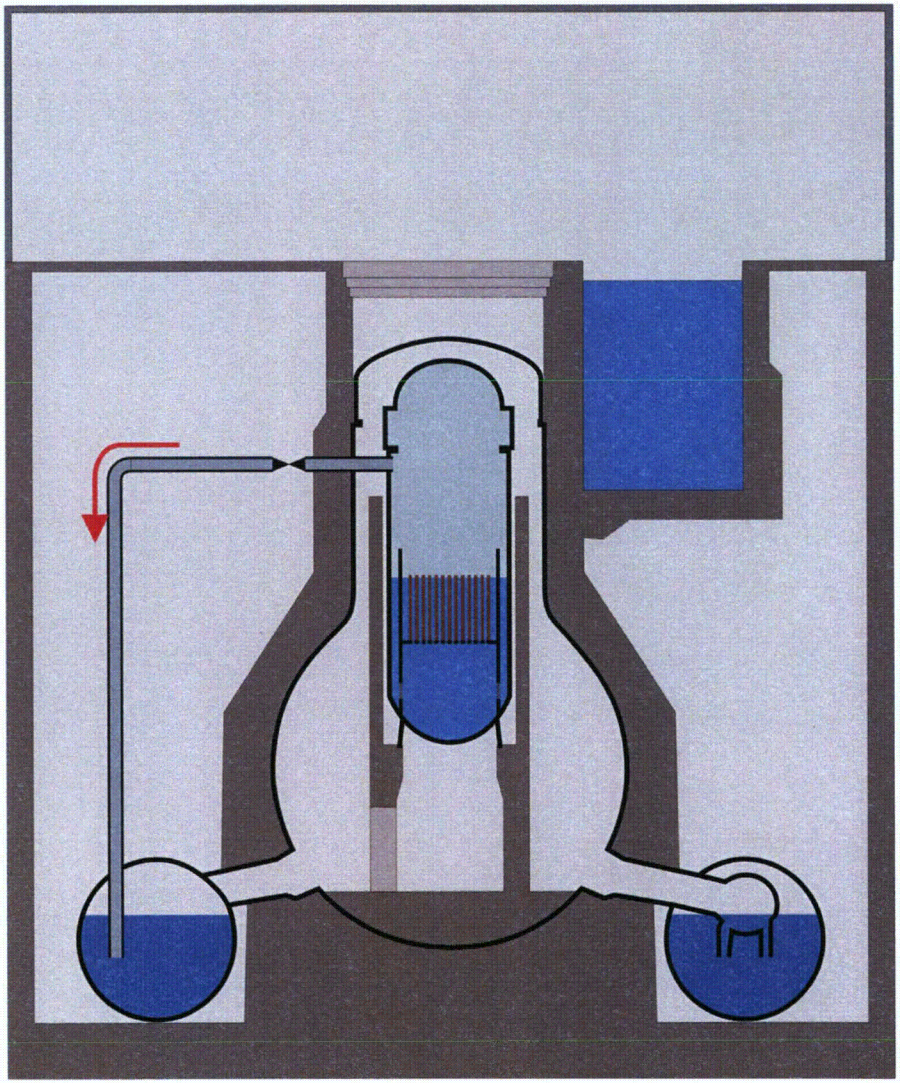

The Fukushima Daiichi Incident

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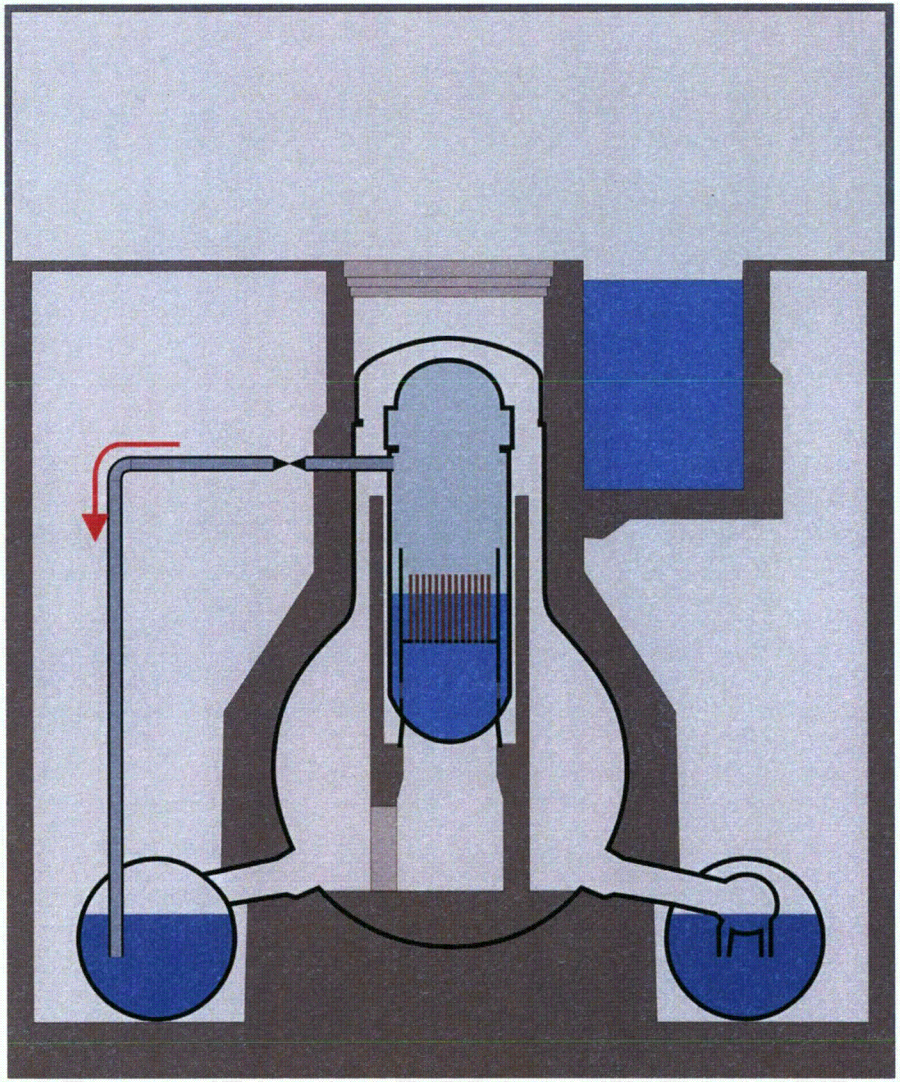


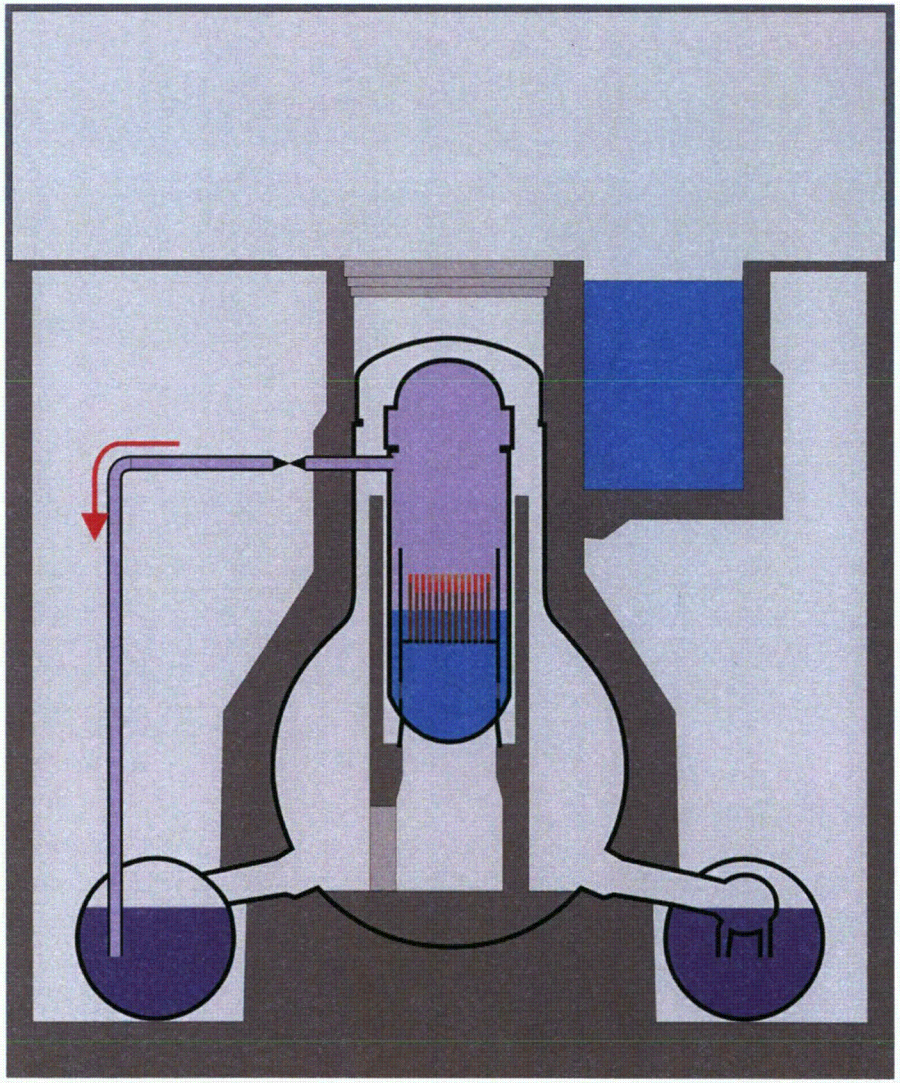
The Fukushima Daiichi Incident

2. Accident progression

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

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

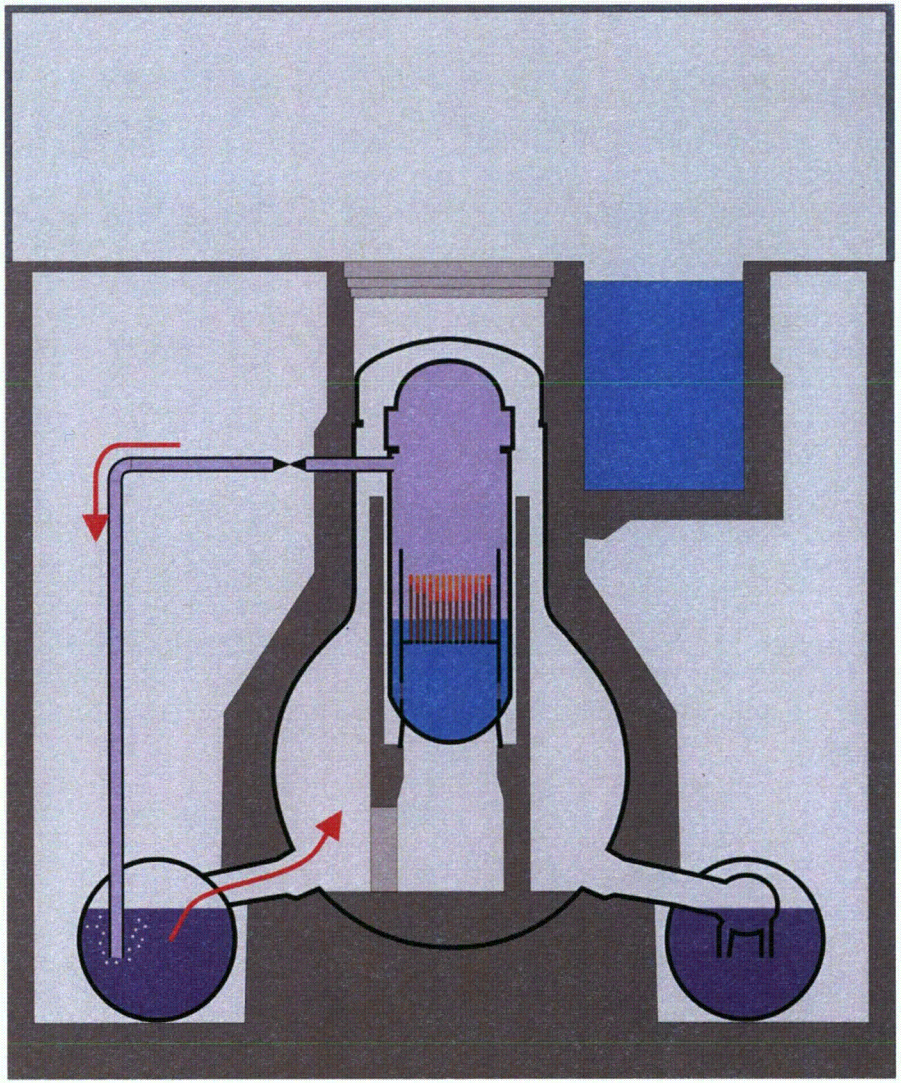
- ~2/3 of the core exposed
  - Cladding temperature exceeds ~900°C
  - Balooning / Breaking of the cladding
  - Release of fission products form the fuel rod gaps



The Fukushima Daiichi Incident

2. Accident progression

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



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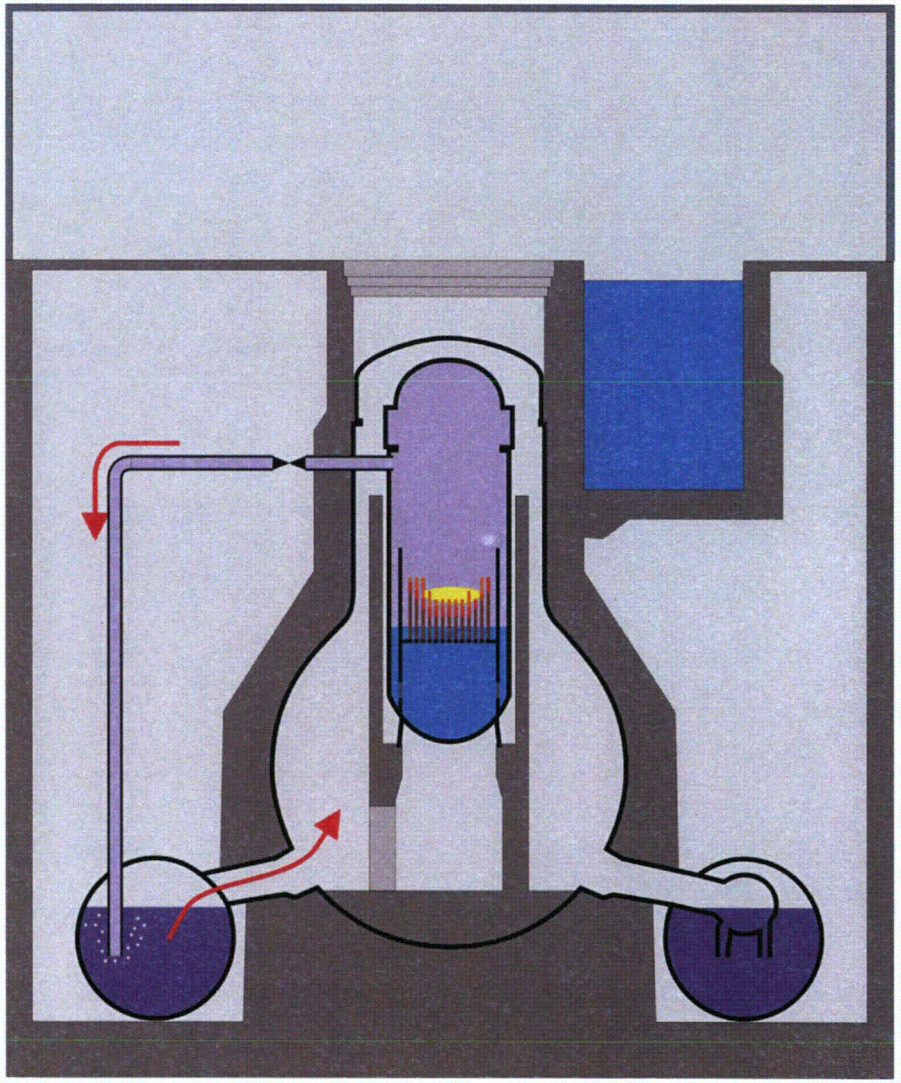
The Fukushima Daiichi Incident

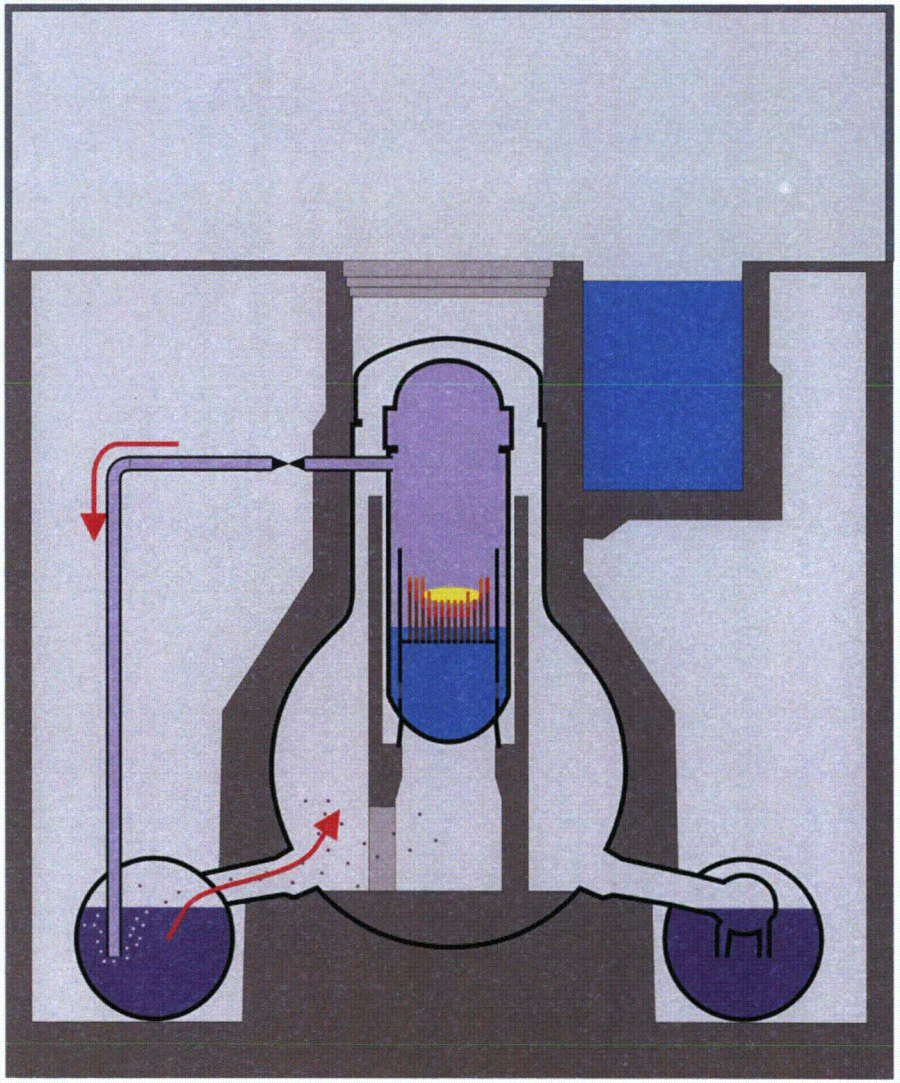
2. Accident progression

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



The Fukushima Daiichi Incident
2. Accident progression

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



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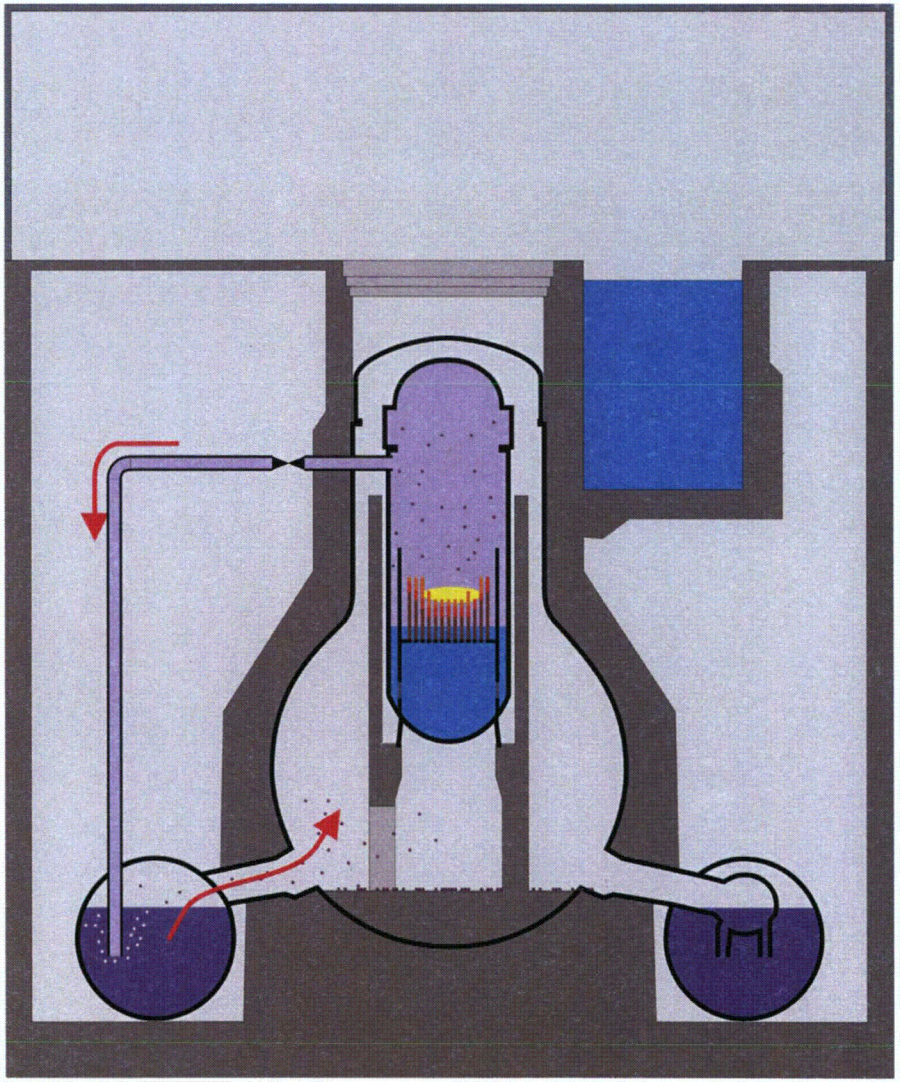
The Fukushima Daiichi Incident

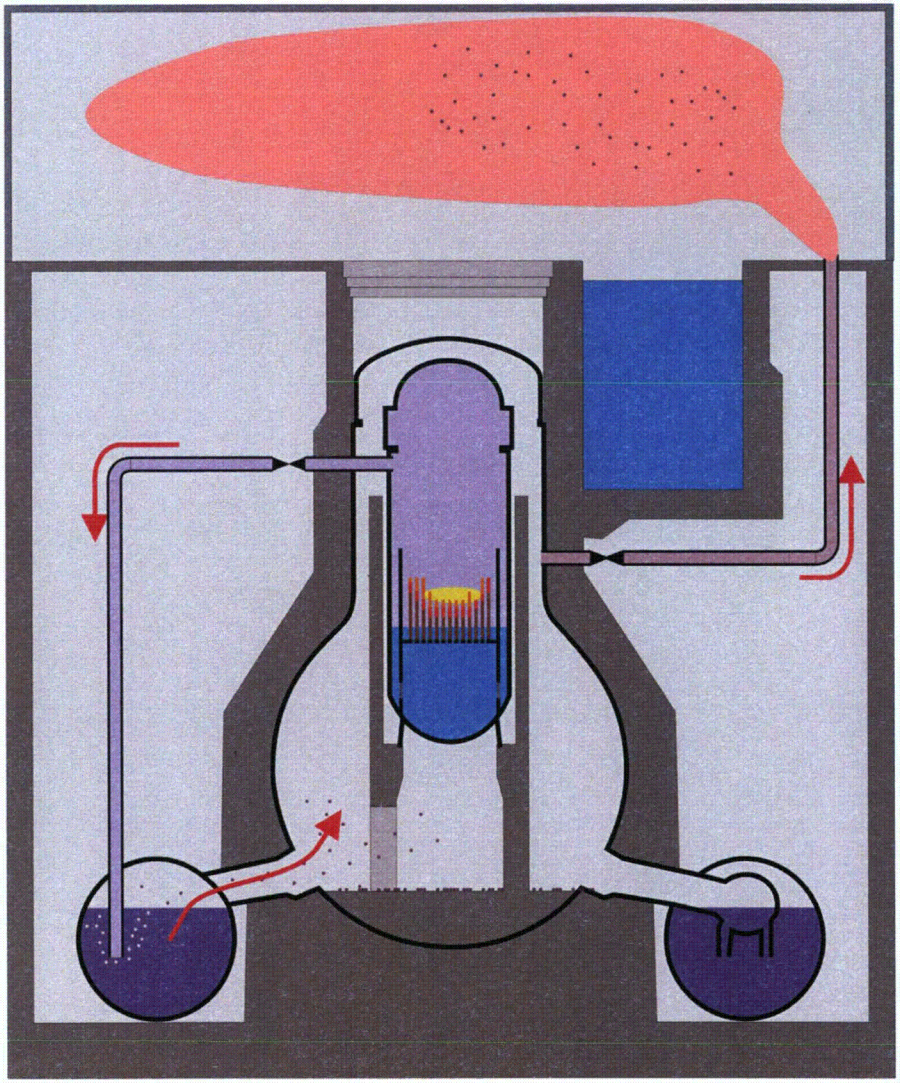
2. Accident progression

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



The Fukushima Daiichi Incident
2. Accident progression

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



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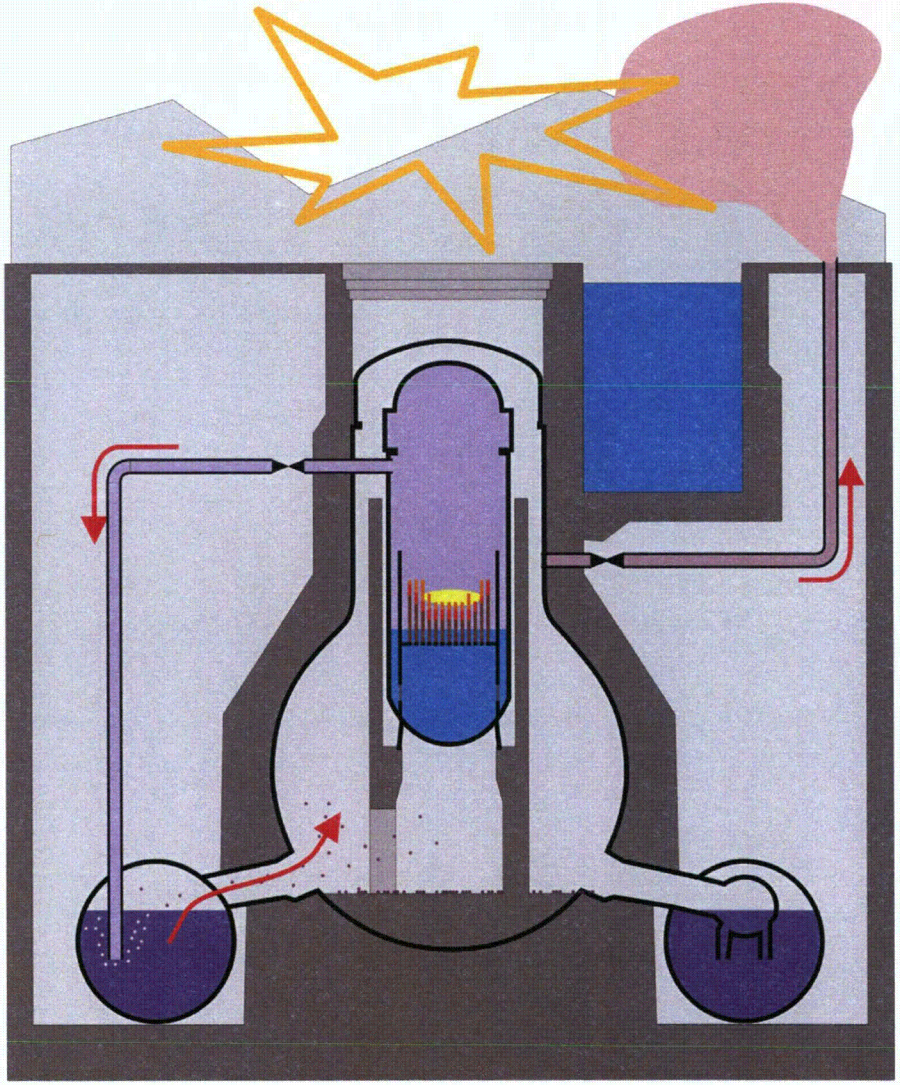
The Fukushima Daiichi Incident
2. Accident progression

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



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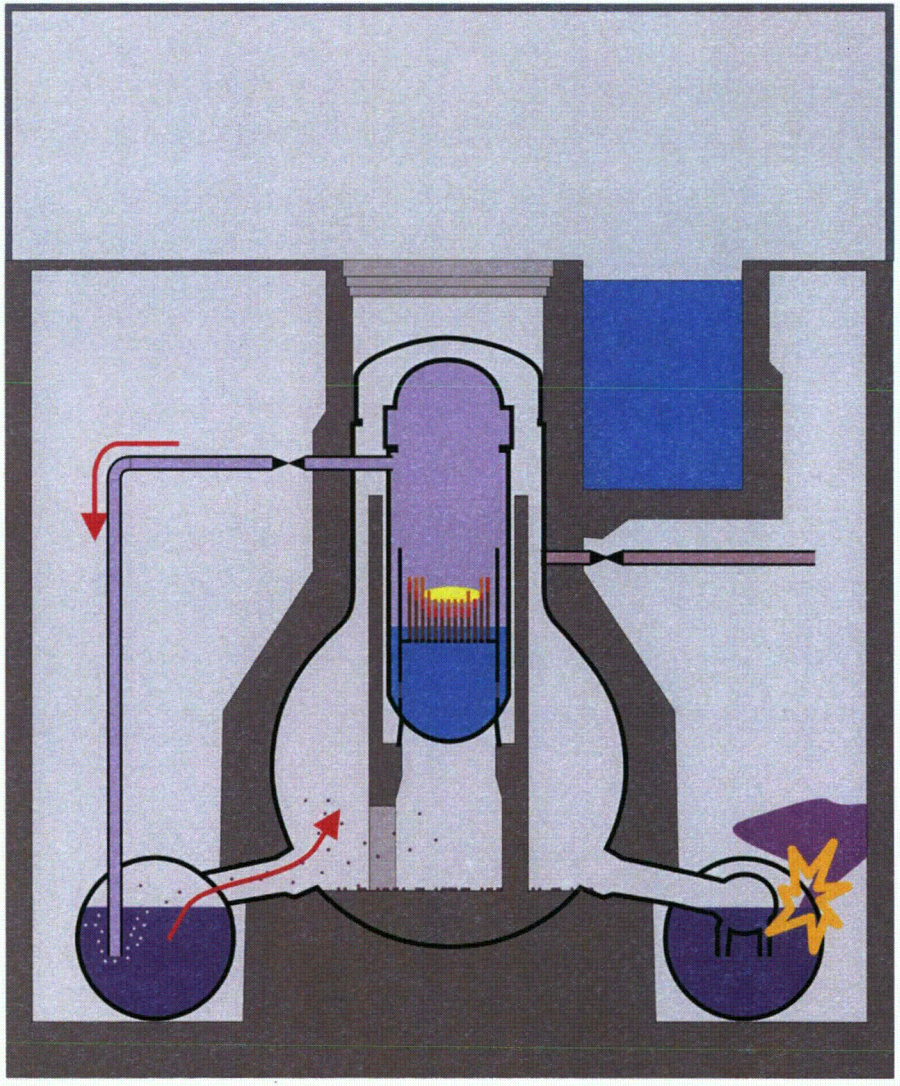
The Fukushima Daiichi Incident

2. Accident progression

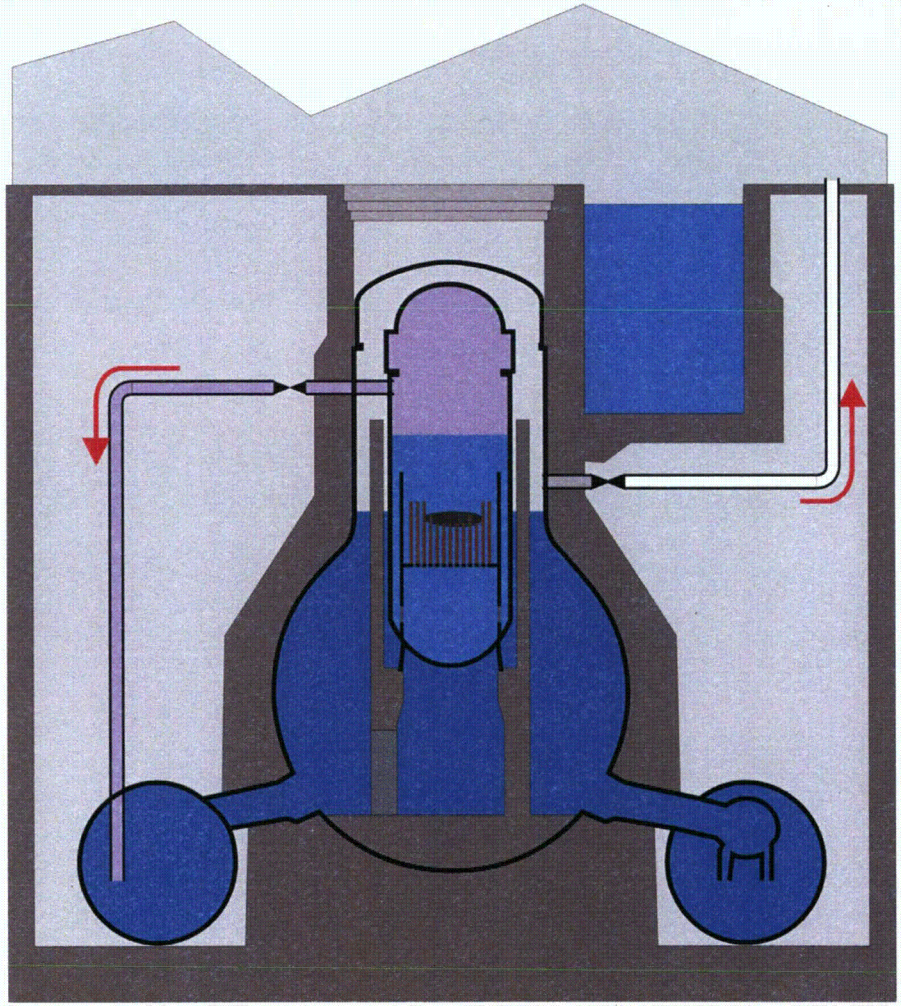
- Unit 2
  - Hydrogen burn inside the reactor building
  - Probably damage to the condensation chamber (highly contaminated water)
  - Uncontrolled release of gas from the containment
  - **Release of fission products**
  - Temporal evacuation of the plant
  - High local dose rates on the plant site due to wreckage hinder further recovery work
- No clear information's why Unit 2 behaved differently



The Fukushima Daiichi Incident

2. Accident progression

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

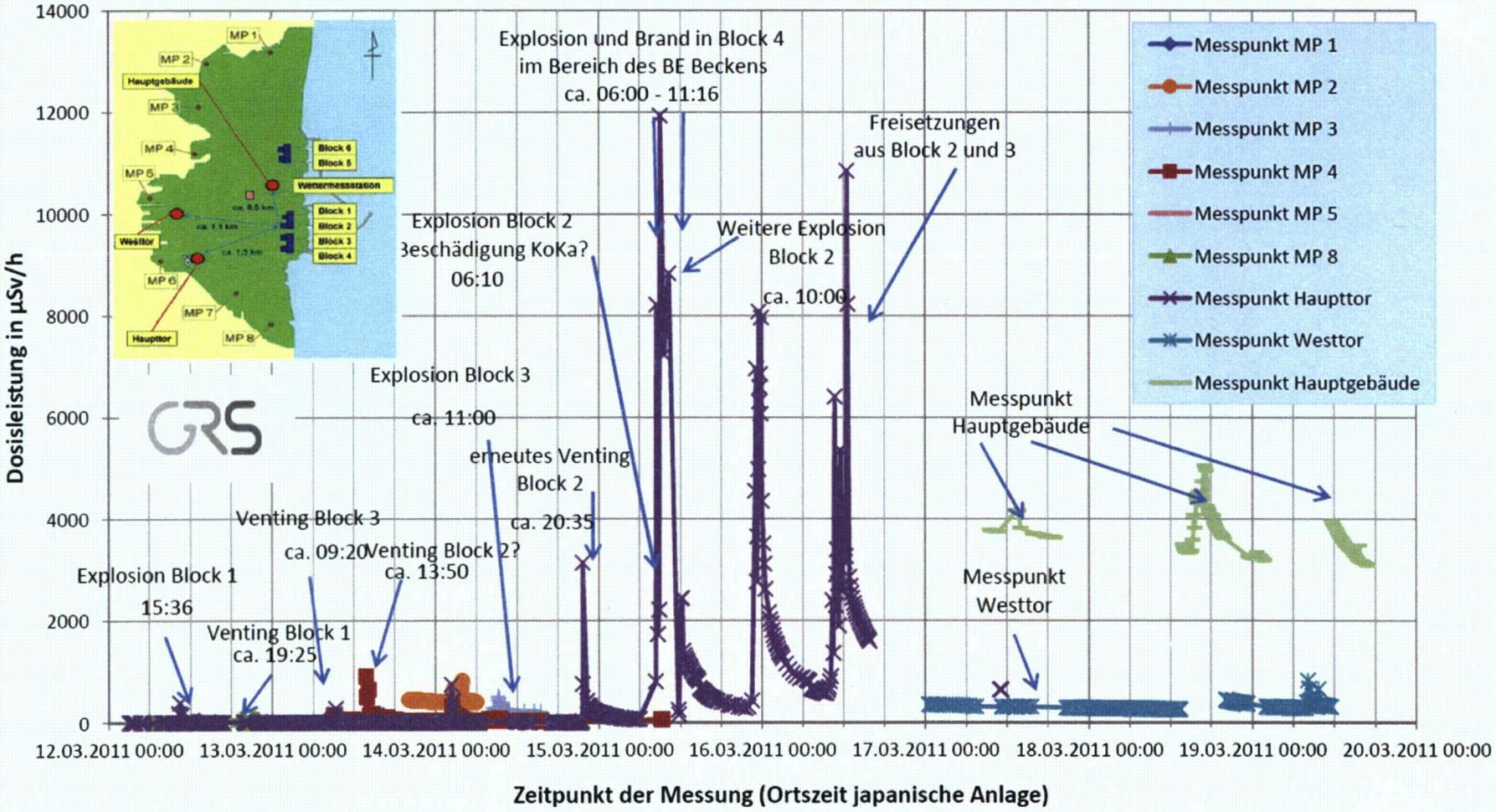


AREVA

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

The Fukushima Daiichi Incident

3. Radiological releases



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The Fukushima Daiichi Incident
3. Radiological releases

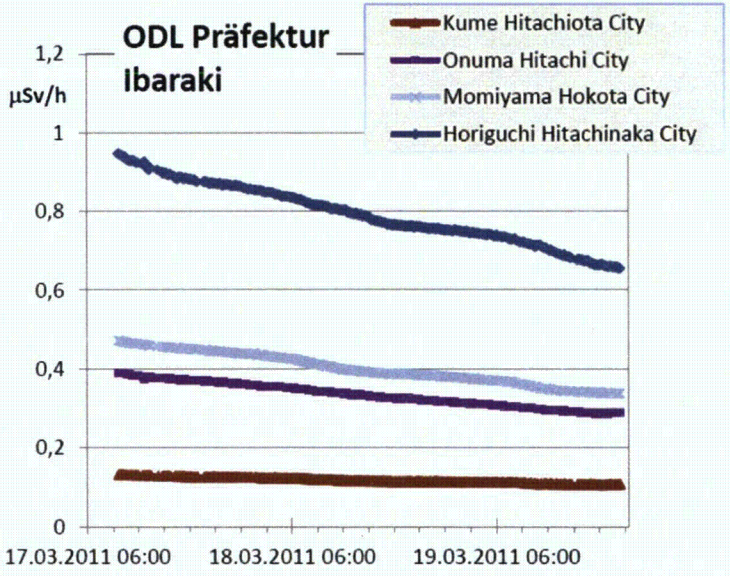
- Outside the Plant site
  - As reactor building mostly intact
    => reduced release of Aerosols (not Chernobyl-like)
  - Fission product release in steam
    => fast Aerosol grows, large fraction falls down in the proximity of the plant
  - Main contribution to the radioactive dose outside plant are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

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

The Fukushima Daiichi Incident

3. Radiological releases

GRS.de



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

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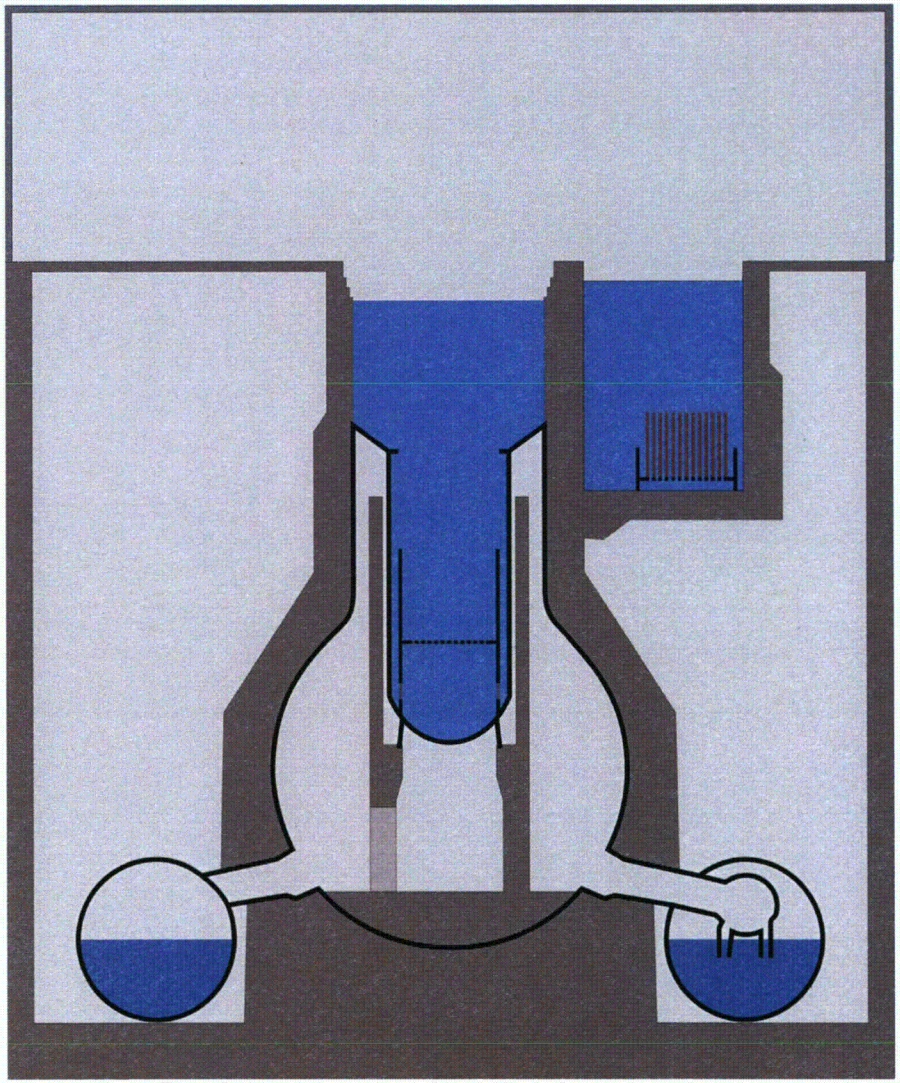
The Fukushima Daiichi Incident

4. Spend fuel pools

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



The Fukushima Daiichi Incident

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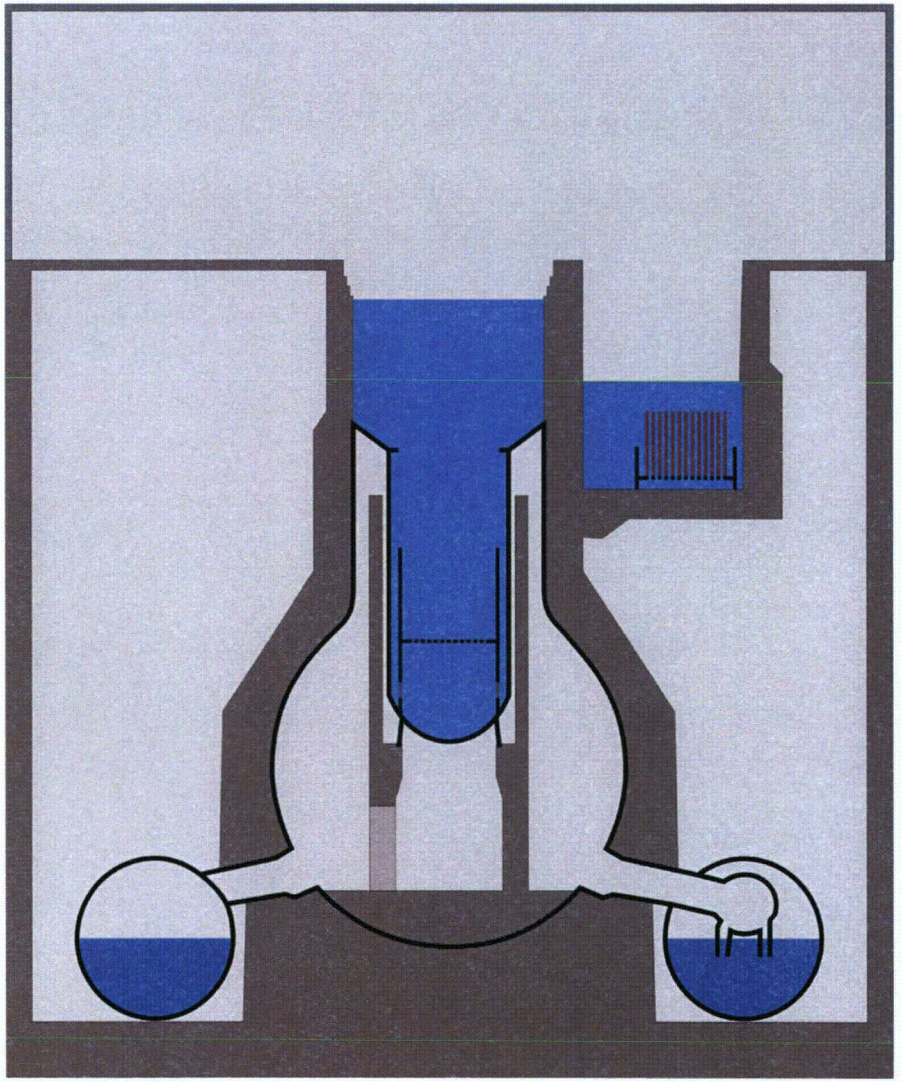

AREVA

The Fukushima Daiichi Incident

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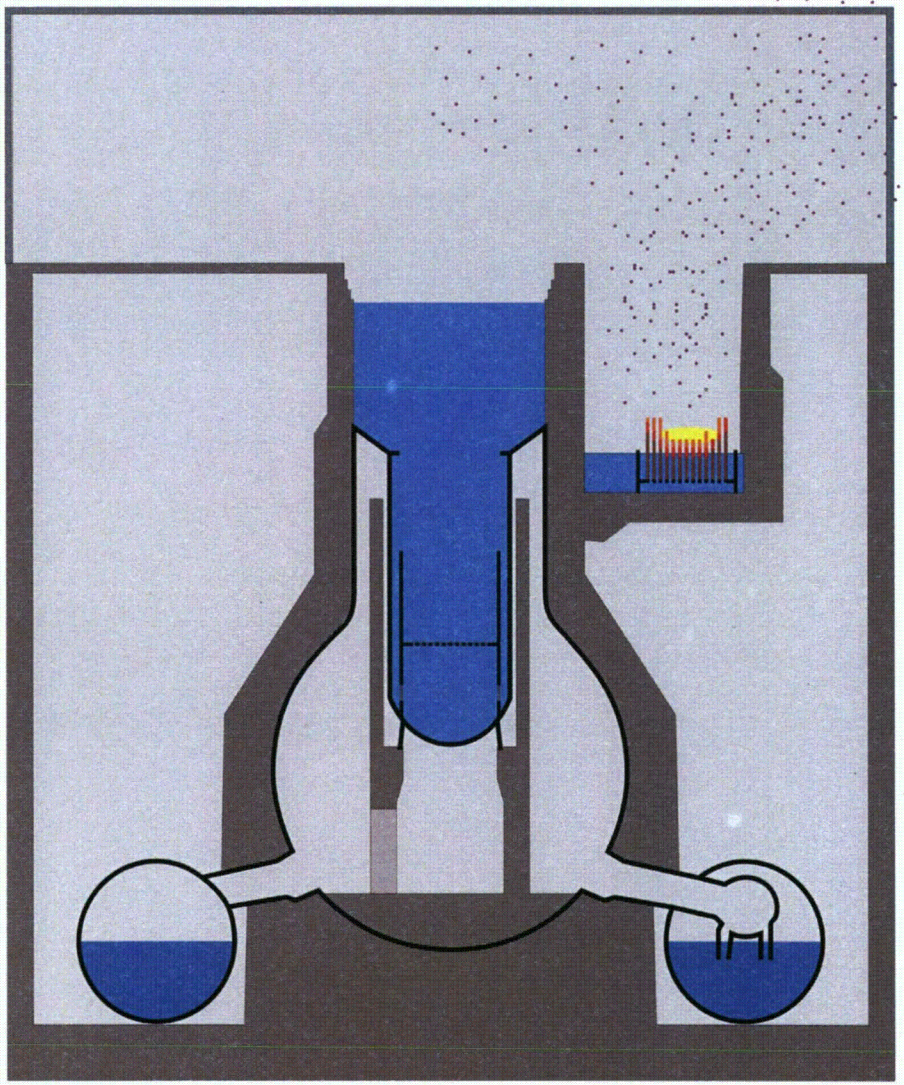
  - Large release
- **It is currently unclear if release from fuel pool already happened**



The Fukushima Daiichi Incident
5. Sources of Information

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

March 23, 2011
Nuclear and Industrial Safety Agency

Seismic Damage Information (the 45th Release)
(As of 12:30 March 23rd, 2011)

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

Major updates are as follows.

1. Nuclear Power Stations (NPSs)

- Fukushima Dai-ichi NPS

<Situation of Water Injection and Water Spray>

- Water spray using Concrete Pump Truck (50t/h) to the Unit 4 was started. (10:00 March 23rd)

(Attached sheet)

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

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

(1) The state of operation

Unit 1 (460MWe): automatic shutdown
Unit 2 (784MWe): automatic shutdown
Unit 3 (784MWe): automatic shutdown
Unit 4 (784MWe): in periodic inspection outage
Unit 5 (784MWe): in periodic inspection outage, cold shutdown at 14:30 March 20th
Unit 6 (1,100MWe): in periodic inspection outage, cold shutdown at 19:27 March 20th

(2) Major Plant Parameters (As of 12:00 March 23rd)

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Reactor Pressure*1 [MPa]	0.457(A) 0.420(B)	0.078(A) 0.078(B)	−0.003(C) 0.135(A)	—	0.108	0.109
CV Pressure (D/W) [kPa]	320	110	100	—	—	—
Reactor Water Level*2 [mm]	−1,750(A) −1,750(B)	−1,300(A) Not available(B)	−1,800(A) −2,300(B)	—	1,744	2,701
Suppression Pool Water Temperature (S/C) [℃]	—	—	—	—	—	—
Suppression Pool Pressure (S/C) [kPa]	300	down scale	down scale	—	—	—
Spent Fuel Pool Water Temperature [℃]	—	51*4	—	Not available*3	39.0	20.0
Time of Measurement	12:00 March 23rd	09:00 March 23rd	09:10 March 23rd		12:00 March 23rd	12:00 March 23rd

*1: Converted from reading value to absolute pressure
*2: Distance from the top of fuel
*3: As of 04:08 March 14th, 84℃
*4: As of 04:20 March 23rd

(3) Situation of Each Unit

<Unit 1>

- TEPCO reported to NISA the event (Inability of water injection of the Emergency Core Cooling System) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (16:36 March 11th)
- 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)
- Increase the amount of water injection ($2m^3/h \rightarrow 18m^3/h$) to the Reactor Core by using water supply system in addition to water extinction system.(02:33 March 23rd)
- Seawater is being injected. (As of 12:30 March 23rd)

<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)
- The Blow-out Panel of reactor building was opened due to the explosion in the reactor building of Unit 3. (After 11:00 March 14th)
- Reactor water level tended to decrease. (13:18 March 14th) TEPCO reported to NISA the event (Loss of reactor cooling functions) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (13:49 March 14th)
- Seawater injection to RPV via the Fire Extinguish line was ready. (19:20 March 14th)
- Water level in RPV tended to decrease. (22:50 March 14th)
- 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)
- Injection of 40t of Seawater to the Spent Fuel Pool was started.(from 15:00 till 17:20 March 20th)
- Power Center of Unit 2 received electricity (15:46 March 20th)
- White smoke generated from Unit 2. (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)
- Seawater injection to RPV continues. (As of 12:30 March 23rd)

<Unit 3>

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

- Seawater was discharged 4 times to Unit 3 by the helicopters of the Self-Defence Force. (9:48, 9:52, 9:58 and 10:01 March 17th)
- The riot police arrived at the site for the water spray from the grand. (16:10 March 17th)
- The Self-Defence Force started the water spray using a fire engine. (19:35 March 17th)
- The water spray from the ground was carried out by the riot police. (From 19:05 till 19:13 March 17th)
- The water spray from the ground was carried out by the Self-Defense Force using 5 fire engines. (19:35, 19:45, 19:53, 20:00 and 20:07 March 17th)
- The water spray from the ground using 6 fire engines (6 tons of water spray per engine) was carried out by the Self-Defence Force. (From before 14:00 till 14:38 March 18th)
- The water spray from the ground using a fire engine provided by the US Military was carried out. (Finished at 14:45 March 18th)
- Hyper Rescue Unit of Tokyo Fire Department (14 vehicles) arrived at the Main Gate (23:10 March 18th) and 6 vehicles of them entered the NPS in order to spray water from the ground. (23:30 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 21:39 March 20th till 03:58 March 21st).
- Works for the recovery of external power supply is being carried out.
- Grayish smoke generated from Unit 3. (At around 15:55 March 21st)
- The smoke was confirmed to be died down. (17:55 March 21st)
- Grayish smoke changed to be whitish and seems to be ceasing. (As of 07:11 March 22nd)
- Water spray (Around 180t) by Hyper Rescue Unit of Tokyo Fire

Department was carried out. (from 15:10 till 15:59 March 22nd)

- Lighting was recovered in the Central Operation Room. (22:43 March 22nd)
- Seawater is being injected to RPV. (As of 12:30 March 23rd)

<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 at Unit 4 had increased. (84 ℃ at 04:08 March 14th)
- It was confirmed that a part of wall in the operation area of Unit 4 was damaged. (06:14 March 15th)
- The fire at Unit 4 occurred. (09:38 March 15th) TEPCO reported that the fire was extinguished spontaneously. (11:00 March 15th)
- The fire occurred at Unit 4. (5:45 March 16th) TEPCO reported that no fire could be confirmed on the ground.(At around 06:15 March 16th)
- The Self-Defence Force started water spray over the Spent Fuel Pool of Unit 4 (09:43 March 20th).
- On-site survey for leading electric cable (From 11:00 till 16:00 March 20th)
- Water spray over the Spent Fuel Pool of Unit 4 by Self-Defence Force was started. (From around 18:30 till 19:46 March 20th).
- Water spray over the Spent Fuel Pool by Self-Defence Force using 13 fire engines was started (From 06:37 till 08:41 March 21st).
- Works for laying electricity cable to the Power Center was completed. (At around 15:00 March 21st)
- Power Center received electricity. (10:35 March 22nd)
- Spray of around 150 tons of water using Concrete Pump Truck (50t/h) was carried out. (from 17:17 till 20:32 March 22nd)
- Water spray using Concrete Pump Truck (50t/h) was started. (10:00 March 23rd)

<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)

<Common Spent Fuel Pool>

- It was confirmed that the water level of Spent Fuel Pool was maintained full at after 06:00 March 18th.
- As of 09:00 March 19th, the water temperature in the pool is 57℃.
- Water spray over the Common Spent Fuel Pool was started (From 10:37 till 15:30 March 21st)
- As of 16:30 March 21st, water temperature of the pool was around 61℃.

● Fukushima Dai-ni NPS (TEPCO)

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

(1) The state of operation

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

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

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

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

(2) Major plant parameters (As of 12:00 March 23rd)

	Unit	Unit 1	Unit 2	Unit 3	Unit 4
Reactor Pressure*1	MPa	0.15	0.12	0.11	0.15
Reactor water temperature	℃	31.0	28.5	33.8	30.3
Reactor water level*2	mm	9,146	10,296	8,394	8,785
Suppression pool water temperature	℃	25	24	26	25
Suppression pool pressure	kPa (abs)	108	106	104	105
Remarks		cold shutdown	cold shutdown	cold shutdown	cold shutdown

*1: Converted from reading value to absolute pressure

*2: Distance from the top of fuel

(3) 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 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. 6,500 nGy/h (19:00 March 14th)
→approx. 5,400 nGy/h (19:00 March 15th)

(3) Report concerning other incidents

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

2. Action taken by NISA

(March 11th)

14:46 Set up of the NISA Emergency Preparedness Headquarters (Tokyo) immediately after the earthquake
15:42 TEPCO reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.
16:36 TEPCO recognized the event (Inability of water injection of the Emergency Core Cooling System) in accordance with the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Units 1 and 2 of Fukushima Dai-ichi NPS. (Reported to NISA at 16:45)
18:08 Regarding Unit 1 of Fukushima Dai-ni NPS, TEPCO reported to

NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

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

19:03 The Government declared the state of nuclear emergency. (Establishment of 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

(March12th)

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

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

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

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

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

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

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

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

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

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

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 recognised the event (Loss of reactor cooling function) to fall under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

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

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

(March 15th)

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

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

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

07:24 Incorporated Administration Agency, Japan Atomic Energy Agency (JAEA) reported to NISA in accordance with the Article 10 of the Act

on Special Measures Concerning Nuclear Emergency Preparedness regarding Nuclear Fuel Cycle Engineering Laboratories, Tokai Research and Development Centre.

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

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

10:30 According to the Nuclear Regulation Act, 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 Iidate Village) was issued regarding the change of the reference value for the screening level for decontamination of radioactivity.

(March 21st)

07:45 Directive titled as "Administration of the stable Iodine" was issued from Local Emergency Response Headquarters to the Prefectural

Governor and the heads of cities, towns and villages (Tomioka Town, Hutaba Town, Okuma Town, Namie Town, Kawauchi Village, Naraha Town, Minamisouma City, Tamura City, Kazurao Village, Hirono Town, Iwaki City and Iidate Village), which directs the above-mentioned governor and the heads to administer stable Iodine under the direction of the headquarters and in the presence of medical experts, and not to administer it on personal judgements.

16:45 Directive titled as "Ventilation for using heating equipments within the in-house evacuation zone" was issued from the 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), 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.

< Possibility on radiation exposure (As of 12:30 March 23rd) >

1. Exposure of residents

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

than 13,000 cpm were decontaminated.

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

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

No. of Counts	No. of Persons
18,000cpm	1
30,000-36,000cpm	1
40,000cpm	1
little less than 40,000cpm*	1
very small counts	5

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

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

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

(5) The Fukushima Prefecture carried out the evacuation of patients and personnel of the hospitals located within 10km area. The screening of all the members showed that 3 persons have the high counting rate. These members were transported to the secondary medical institute of

exposure. As a result of the screening on 60 fire fighting personnel involved in the transportation activities, the radioactivity higher than twice of the back ground was detected on 3 members. Therefore, all the 60 members were decontaminated.

2. Exposure of workers

(1) As for the 18 workers conducting operations in Fukushima Dai-ichi NPS, results of measurements are as follows;

One worker: At the level of exposure as 106.3 mSv, no risk of internal exposure and no medical treatment required.

Other workers: At the level of no risk for health but concrete numerical value is unknown.

(2) As for the 7 people working at the time of explosion at around the Unit 3 of Fukushima Dai-ichi NPS who were injured and conscious, 6 out of 7 people were decontaminated by an industrial doctor of the clinic in Fukushima Dai-ni NPS, and confirmed to have no risk. The other one was decontaminated at the clinic and the medical treatment was completed.

3. Others

(1) Fukushima Prefecture has started the screening from 13 March. It is carried out by rotating the evacuation sites and at the 12 places (set up permanently) such as health offices. The results of screening are being totalled up.

(2) 5 members of Self-Defence Force who worked for water supply in Fukushima Dai-ichi NPS were exposed. After the work (March 12th), 30,000 cpm was counted by the measurement at Off site Centre. The counts after decontamination were between 5,000 and 10,000 cpm. One member was transferred to National Institute of Radiological Science. No other exposure of the Self-Defence Force member was confirmed at the Ministry of Defence.

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

<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/cm^2 measured by a gamma-ray survey meter or 6,000 cpm

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

<Directives of administrating stable Iodine during evacuation>

(1) On March 16th, the Local 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 judgements.

<Situation of the injured (As of 12:30 March 23rd)>

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 16th.)

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 12:30 March 23rd)>

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>

On March 21st, Directive from the Head of Government Nuclear Emergency Response Headquarters to the Prefectural Governors of Fukushima, Ibaraki, Tochigi and Gunma was issued, which directs above-mentioned governors to issue a request to relevant businesses and people to suspend shipment of the following products (①, ②) for the time being.

① Spinach and *Kakina* (a green vegetable) produced in Fukushima, Ibaraki, Tochigi and Gunma Prefectures

② Raw milk produced in Fukushima Prefecture

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

On March 21st, Directive titled as "Ventilation for using heating equipments within the in-house evacuation zone" from the 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.

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

From: RST01 Hoc
Sent: Saturday, March 26, 2011 6:33 PM
To: RST07 Hoc; RST08 Hoc; RST03 Hoc; RST09 Hoc
Subject: FW: powerpoint on Japan
Attachments: NISA.Status AllUnits..1203.1200. 6pp.en20110323-3-2.pdf; NISA. Sequence and status. 2303.21pp.en20110323-3-1.pdf; Fukuchima_eng_20110320.pps

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From: McMurtray, Anthony
Sent: Saturday, March 26, 2011 6:32 PM
To: RST01 Hoc
Subject: FW: powerpoint on Japan

fyi. Please get this to members of the RST team, especially the Fukuchima eng file (Powerpoint presentation of event from AREVA). This info. was sent to my staff from ASME.

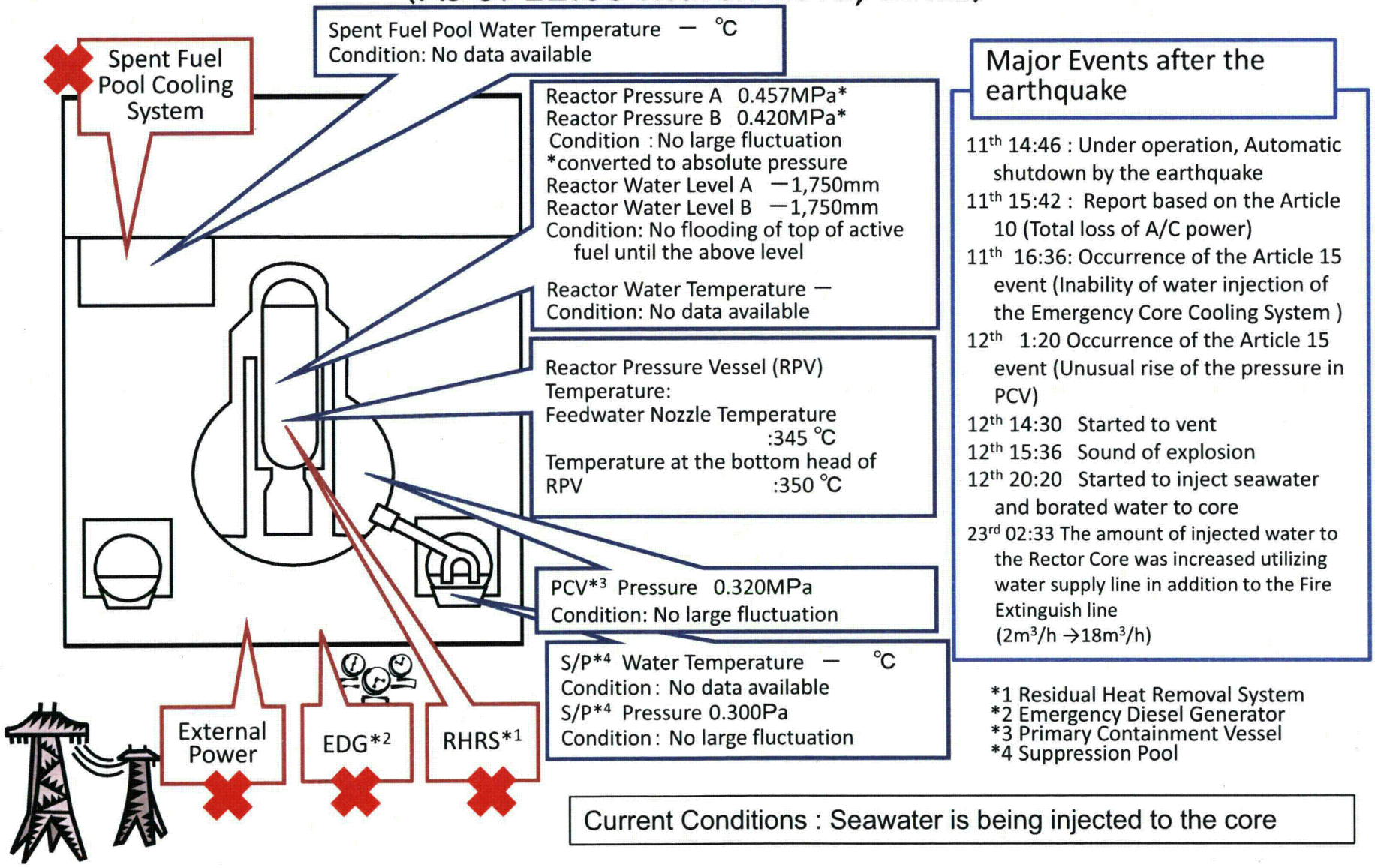
Tony McMurtray

From: Orenak, Michael
Sent: Friday, March 25, 2011 2:59 PM
To: Bedi, Gurjendra; Billerbeck, John; Farnan, Michael; Huang, John; McMurtray, Anthony; Wolfgang, Robert
Subject: powerpoint on Japan

I just received this from the Symposium session chairs. Check out the interesting powerpoint presentation if you have time.

From: Robert Horvath [mailto:HorvathR@asme.org]
Sent: Friday, March 25, 2011 2:32 PM
To: jeallen@IEIAForum.org; Robert_Parry@fpl.com; Orenak, Michael; john.zudans@ch2m.com; Robert.Kershaw@aps.com
Cc: Claude Thibault
Subject:

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 1
(As of 12:00 March 23rd, 2011)



Major Events after the earthquake

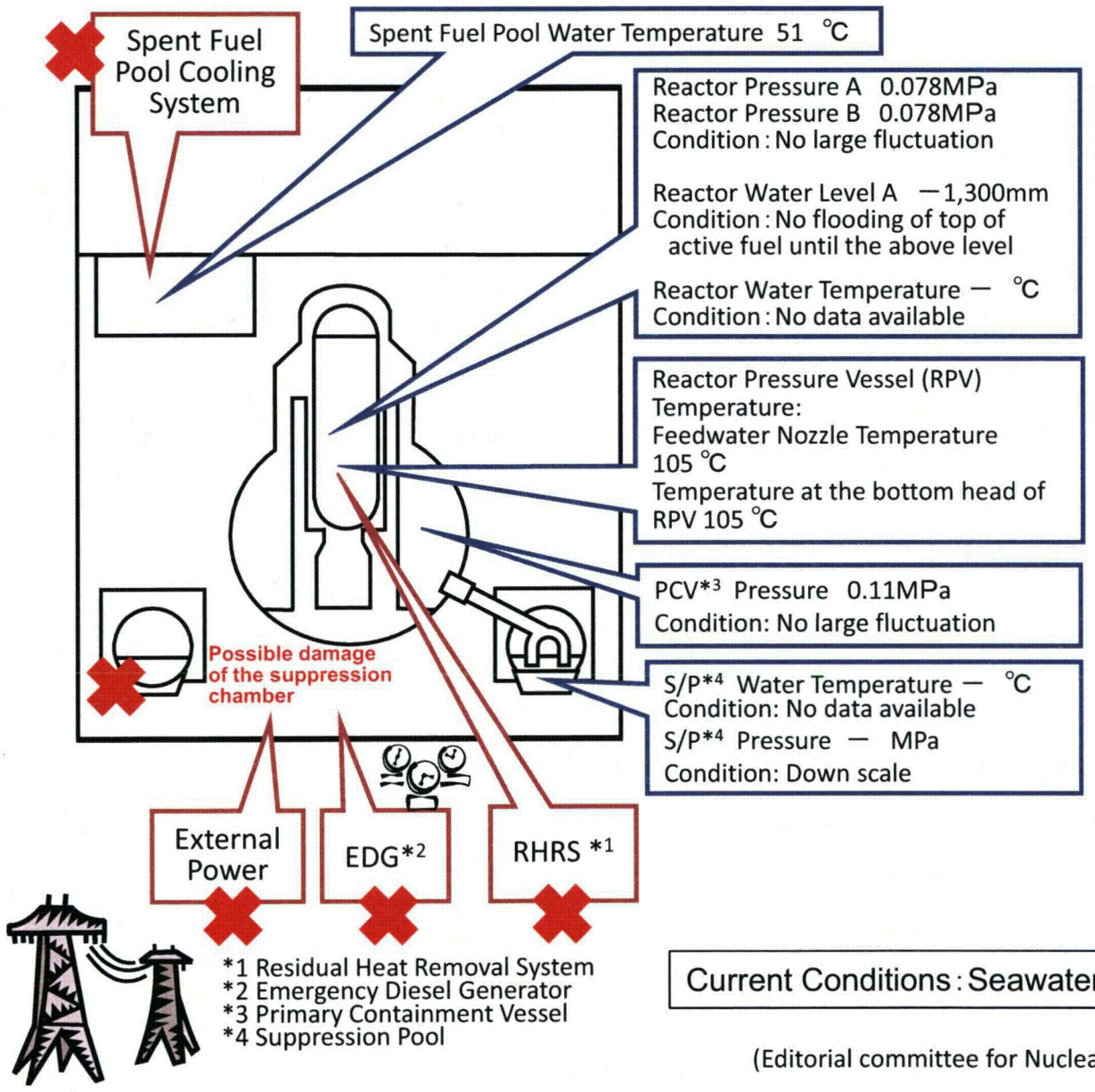
- 11th 14:46 : Under operation, Automatic shutdown by the earthquake
- 11th 15:42 : Report based on the Article 10 (Total loss of A/C power)
- 11th 16:36: Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
- 12th 1:20 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV)
- 12th 14:30 Started to vent
- 12th 15:36 Sound of explosion
- 12th 20:20 Started to inject seawater and borated water to core
- 23rd 02:33 The amount of injected water to the Rector Core was increased utilizing water supply line in addition to the Fire Extinguish line ($2m^3/h \rightarrow 18m^3/h$)

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

Current Conditions : Seawater is being injected to the core

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 2
(As of 12:00 March 23rd, 2011)



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

Major Events after the earthquake

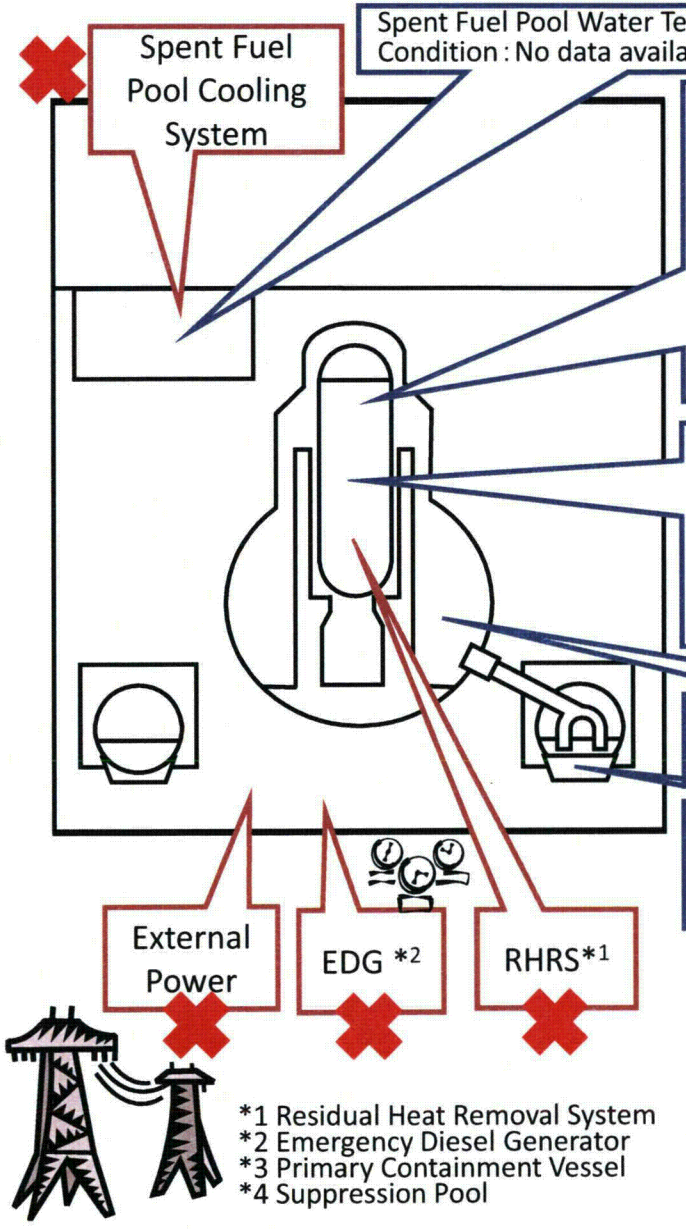
- 11th 14:46 Under operation, Automatic shutdown by the earthquake
- 11th 15:42 Report based on the Article 10 (Total loss of A/C power)
- 11th 16:36 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
- 14th 13:25 Occurrence of the Article 15 event (Loss of reactor cooling functions)
- 14th 22:50 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV)
- 15th 6:10 Sound of explosion
- 15th around 6:20 Possible damage of the suppression chamber
- 20th 15:05～17:20 Approximately 40 ton seawater injection to the Spent Fuel Pool (SFP) via Fuel Pool Cooling System (FPC)
- 20th 15:46 Power Center received electricity.
- 21st 18:22 White smoke generated. The smoke died down and almost invisible.
- 22nd 16:07 Injection of around 18 tons of seawater to the Spent Fuel Pool

Current Conditions : Seawater is being injected to the core

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 3

(As of 12:00 March 23rd, 2011)



Spent Fuel Pool Water Temperature — ℃
Condition : No data available

Reactor Pressure C -0.003MPa
Reactor Pressure A 0.135MPa
Condition : Tend to decrease

Reactor Water Level A —1,800mm
Reactor Water Level B —2,300mm
Condition : No flooding of top of active fuel until the above level

Reactor Water Temperature — ℃
Condition : No data available

Reactor Pressure Vessel (RPV) Temperature
Feedwater Nozzle Temperature : 304.8℃
Temperature at the bottom head of RPV :225.5℃

PCV*3 Pressure 0.100MPa
Condition: No large fluctuation

S/P*4 Water Temperature — ℃
Condition : No data available
S/P*4 Pressure — MPa
Condition: Down scale

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

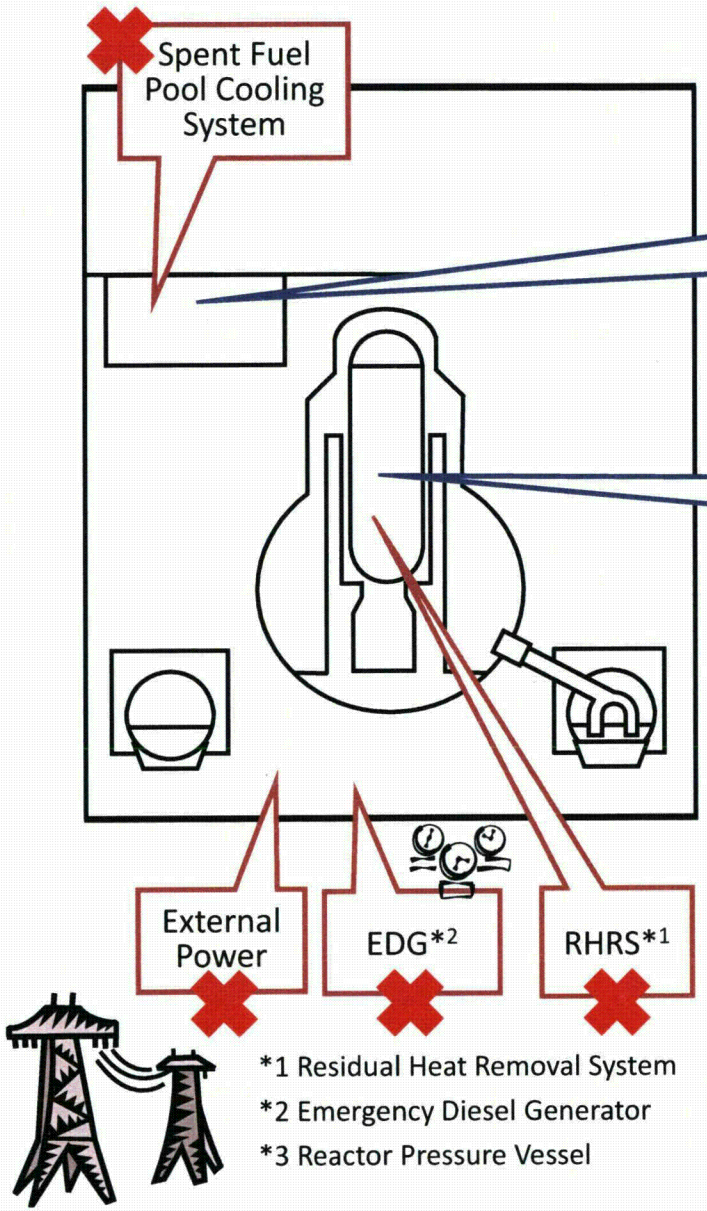
Major Events after the earthquake

11th 14:46 Under operation, Automatic shutdown by the earthquake
11th 5:42 Report based on the Article 10 (Total loss of A/C power)
13th 5:10 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
13th 9:20 Started to vent
14th 7:44 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV)
14th 11:01 Sound of explosion
16th around 8:30 White smoke generated.
17th 9:48～10:01 Water discharge by the helicopters of Self-Defense Force (4 times)
19:05～20:07 Water spray from the ground by High pressure water-cannon trucks (Police: once, Self-Defense Force: 5 times)
18th before 14:00～14:38 Water spray from the ground by 6 fire engines of Self-Defense Force
~14:45 Water spray from the ground by a fire engine of the US Military
19th 0:00 ～01:00 Water spray by Tokyo Fire Department
19th 14:10 ～ 20th 3:40 Water spray by Tokyo Fire Department
20th 11:00 Pressure of PCV rose(320kPa).Afterward fell.
20th 20:39 ～ 21st 3:58 Water spray by Tokyo Fire Department
21st about 15:55 Grayish smoke generated and was confirmed to be died down at 17:55.
22nd 15:10 ～15:59 Water spray by Tokyo Fire Department
22nd 22:43 Lightening in the Central Control Room was recovered.

Current Conditions : Water spray to Spent Fuel Pool and sea water injection to the Reactor Core

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 4
(As of 12:00 March 23rd, 2011)



In periodic inspection outage

Water temperature in the pools is not available

No fuel is inside the reactor core

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

Major events after the earthquake

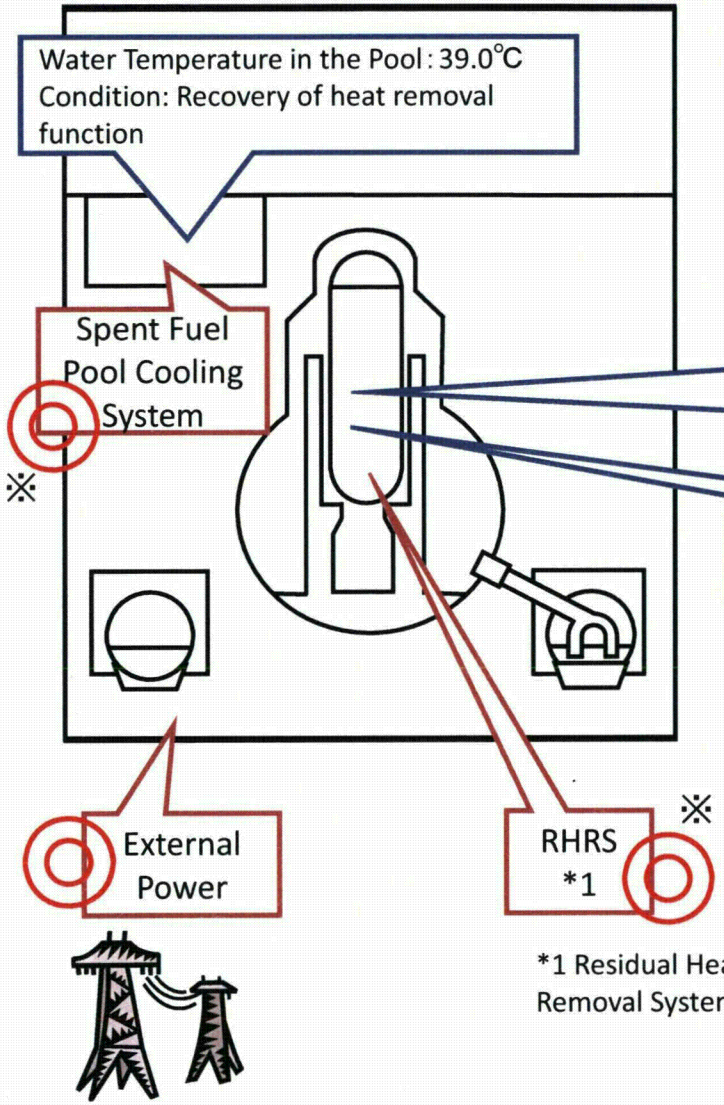
In periodic inspection outage when the earthquake occurred.
11th 15:42 Report based on the Article 10 (Total loss of A/C power)
14th 4:08 Water temperature in the Spent Fuel Pool, 84℃
15th 6:14 Damage of wall in the 4th floor confirmed
15th 9:38 Fire occurred in the 3rd floor. (12:25 extinguished)
16th 5:45 Fire occurred. TEPCO couldn't confirm any fire on the ground. (6:15)
20th 9:43 Water spray over the Spent Fuel Pool by Self-Defense Force
20th around 18:30~19:46 Water spray over the Spent Fuel Pool by Self-Defense Force
21st 6:37~8:41 Water spray over the Spent Fuel Pool by Self-Defense Force
21st about 15:00 Work for laying cable to Power Center was completed.
22nd 10:35 Power Center received electricity
22nd 17:17～20:32 Water spray by Concrete Pump Track
23rd 10:00～ Water spray by Concrete Pump Track

Current Conditions：No fuel is in RPV*3. Water was evaluated to remain in the Pool（by TEPCO）

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 5
(As of 12:00 March 23rd, 2011)

In periodic inspection outage



*1 Residual Heat Removal System

Current Conditions :
Cold shutdown at 14:30 March 20th.
Receiving electricity from external power supply from 11:36 March 21st.

Reactor Pressure : 0.108MPa*
Reactor Water Level : 1.744mm
Reactor Water Temperature : 30.7℃
Condition : Pressure is under control.
*converted to absolute pressure

Reactor Pressure Vessel Temperature:
Monitoring by Rector Water Temperature

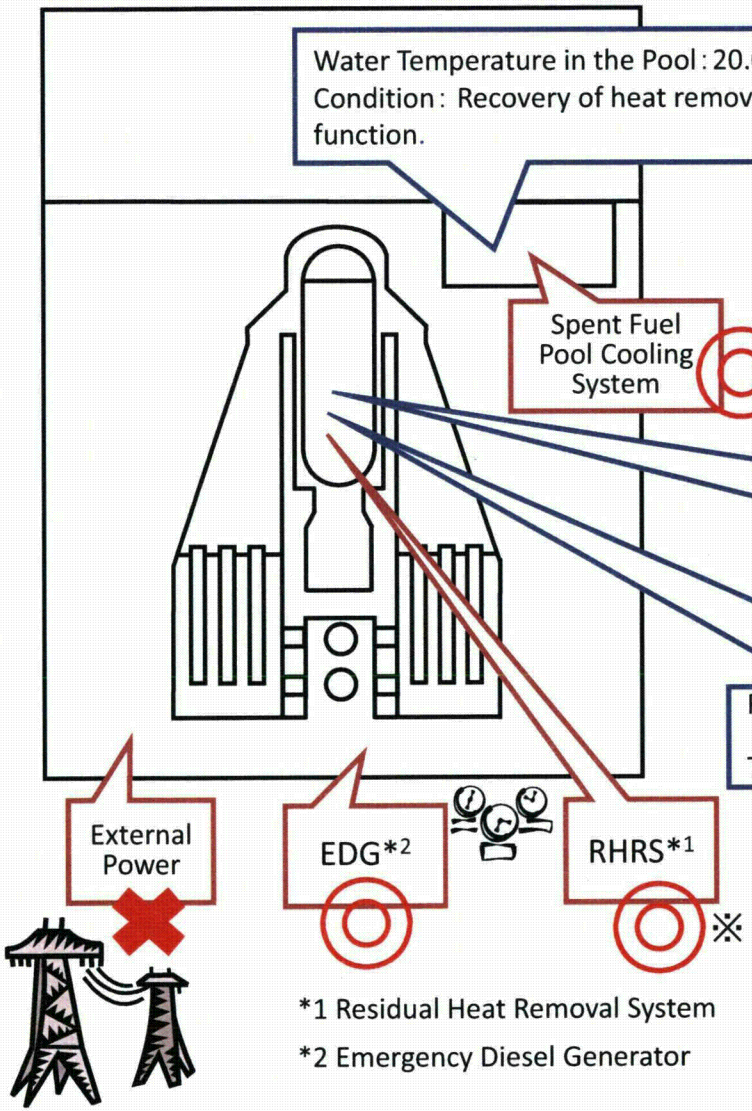
※Heat removal was carried out alternately for the water in the Reactor Core and the Spent Fuel Pool.

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 6
(As of 12:00 March 23rd, 2011)

In periodic inspection outage

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



*1 Residual Heat Removal System

*2 Emergency Diesel Generator

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

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