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The Fukushima Daiichi Incident

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

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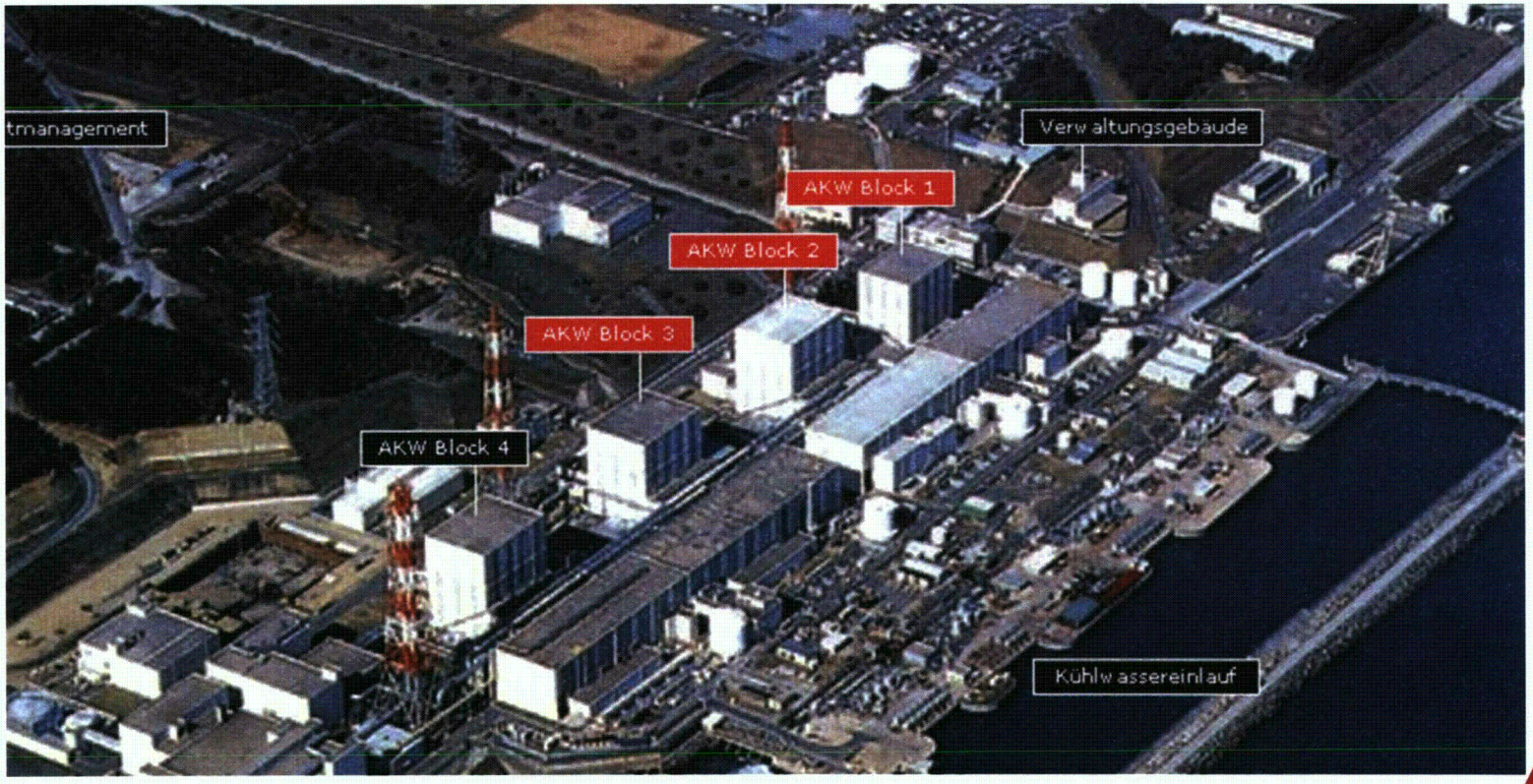
The Fukushima Daiichi Incident
1. Plant Design

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



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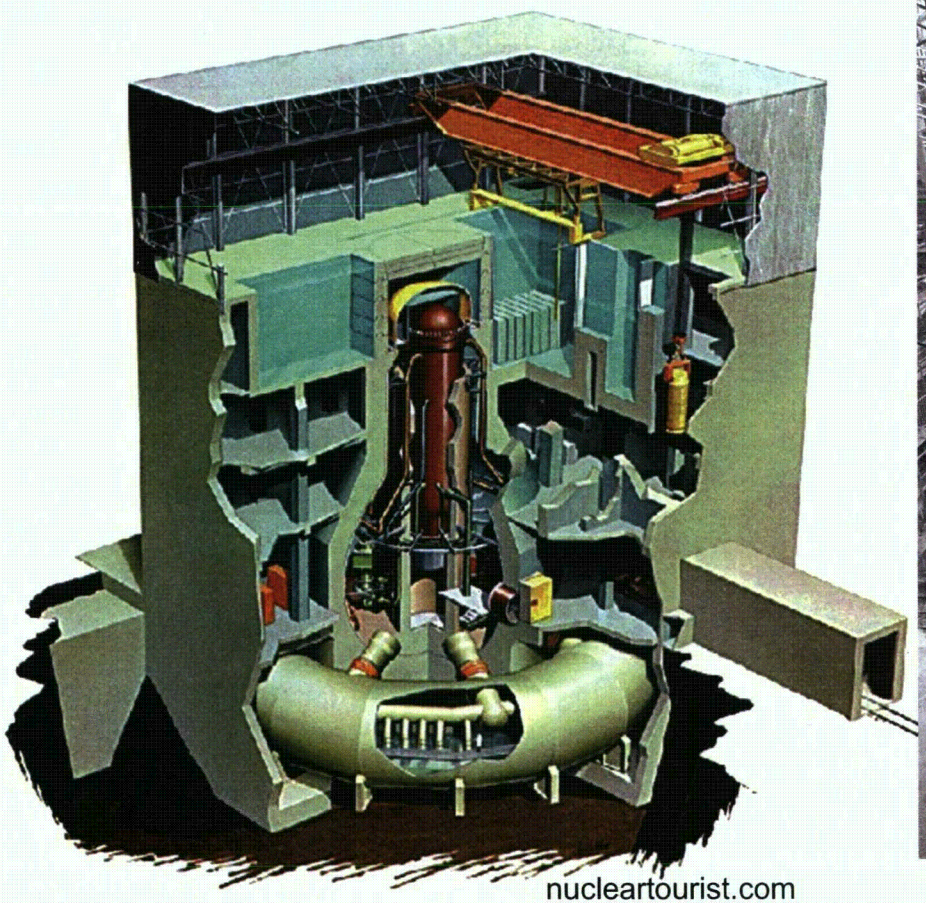
The Fukushima Daiichi Incident

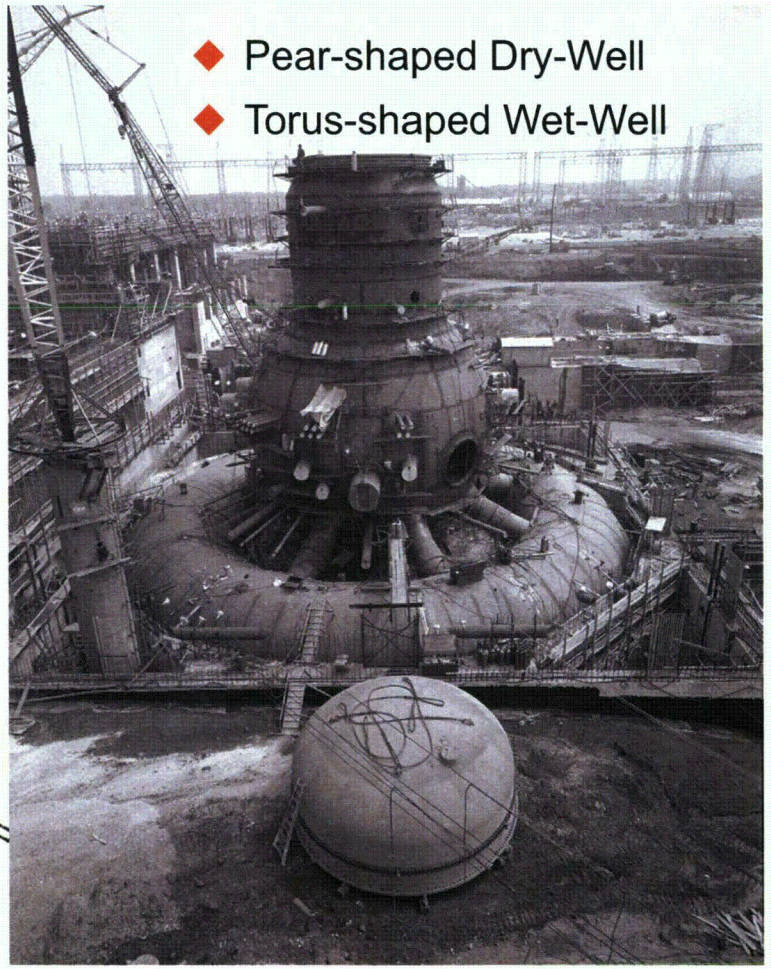
1. Plant Design

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



nucleartourist.com

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



en.wikipedia.org/wiki/Browns_Ferry_Nuclear_Power_Plant

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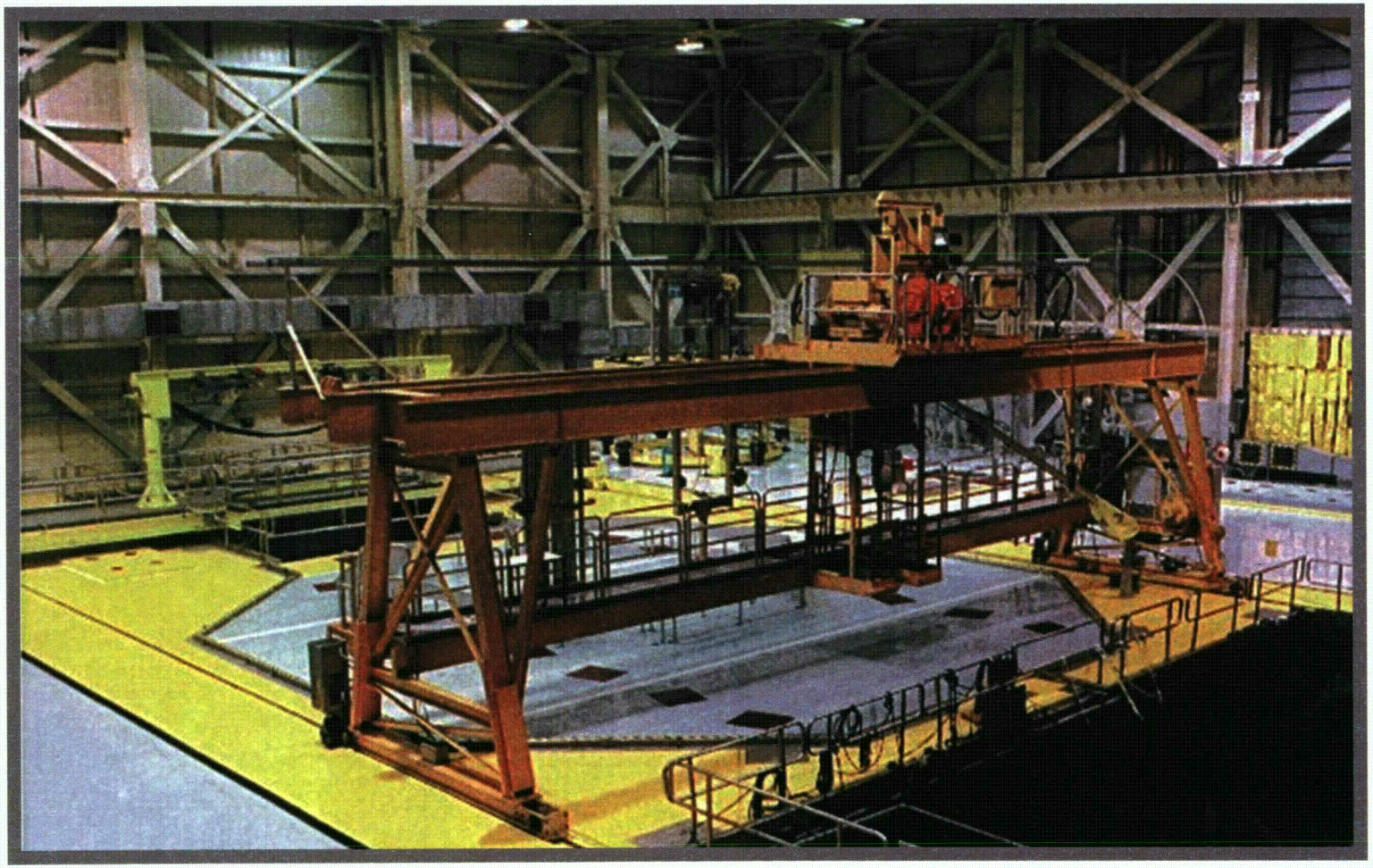
The Fukushima Daiichi Incident
1. Plant Design

- Service Floor



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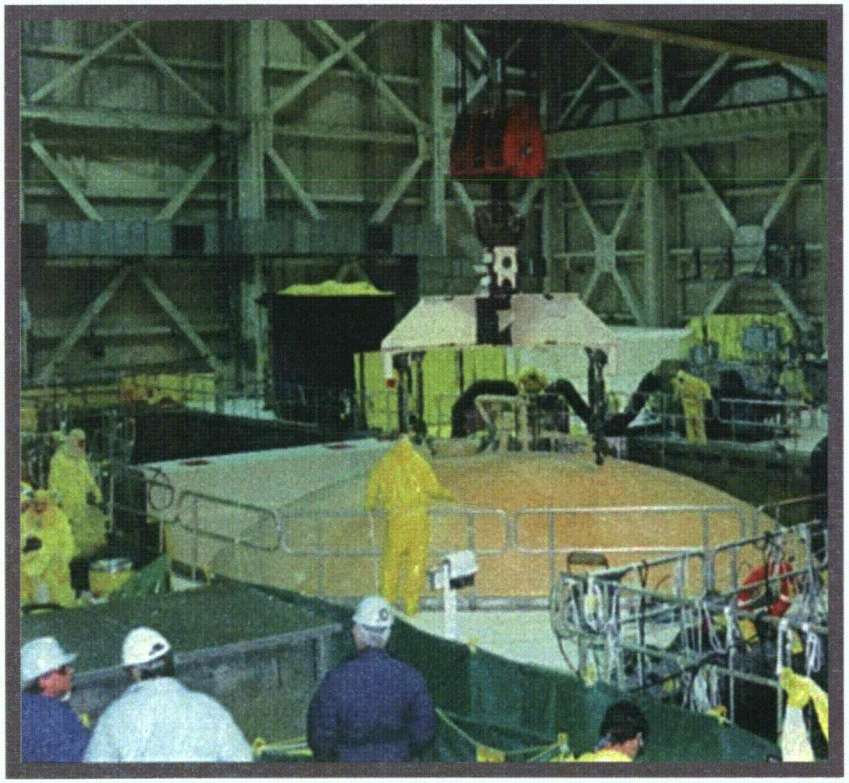
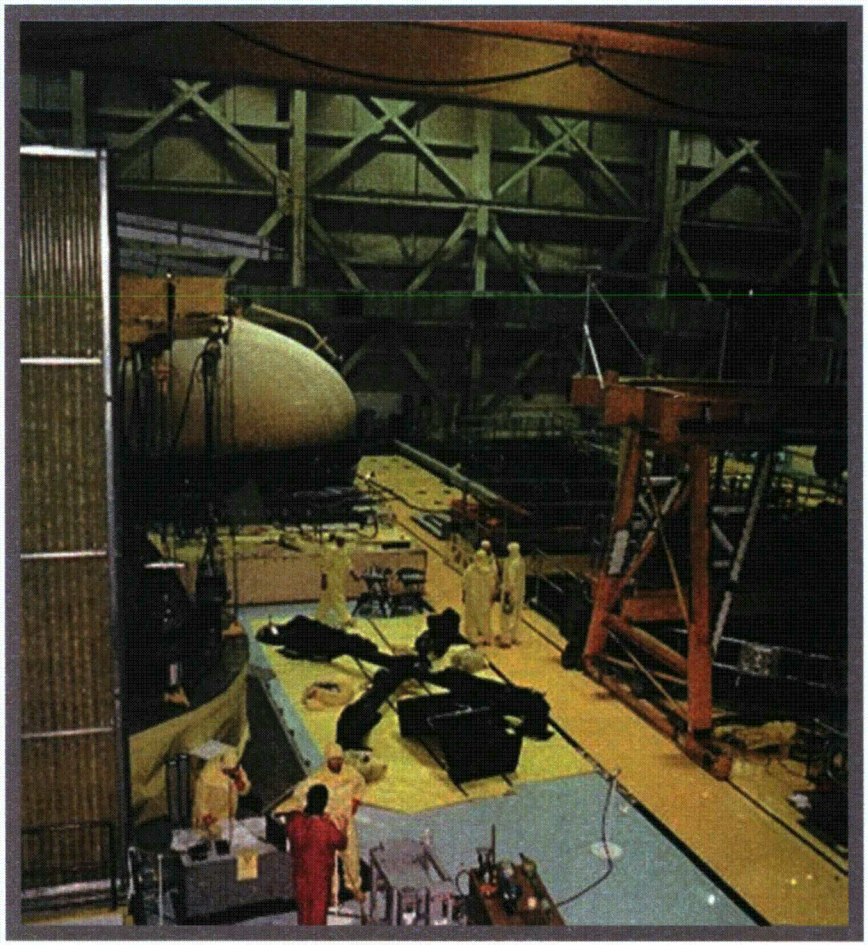
The Fukushima Daiichi Incident
1. Plant Design

- Lifting the Containment closure head





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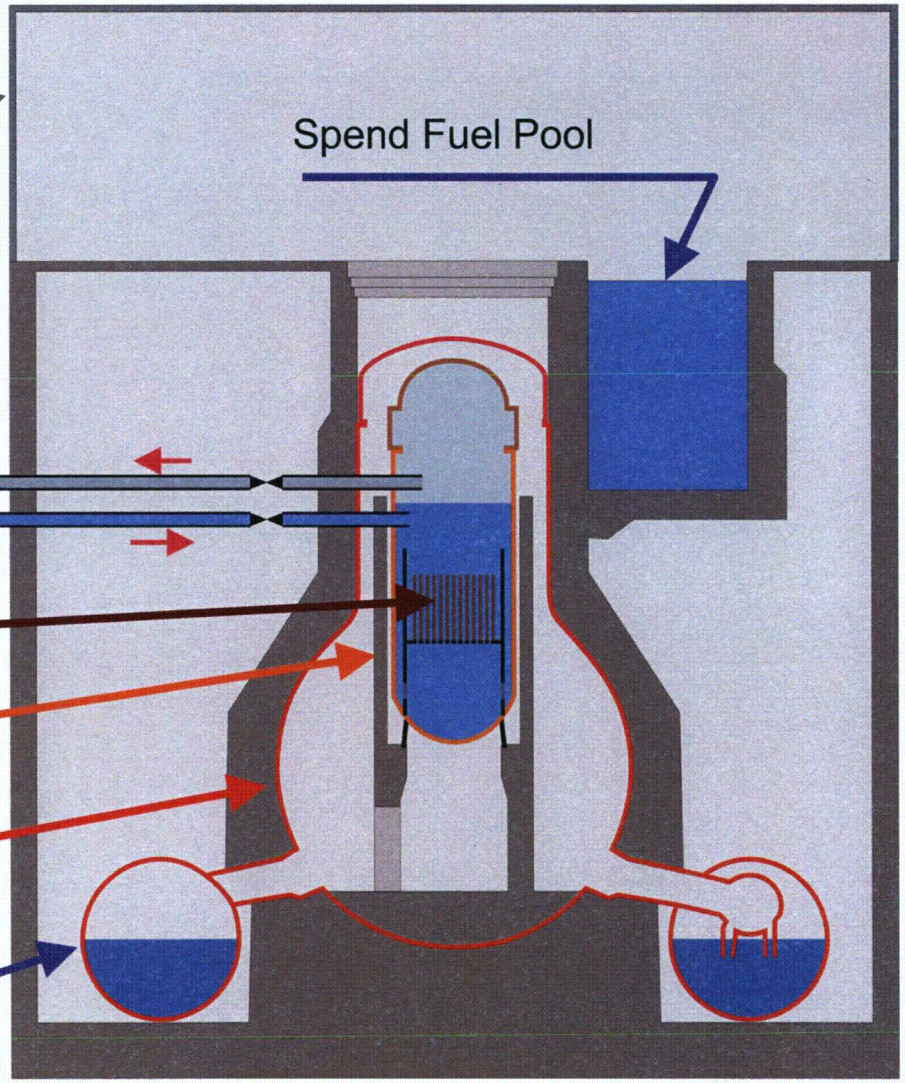
The Fukushima Daiichi Incident

1. Plant Design

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



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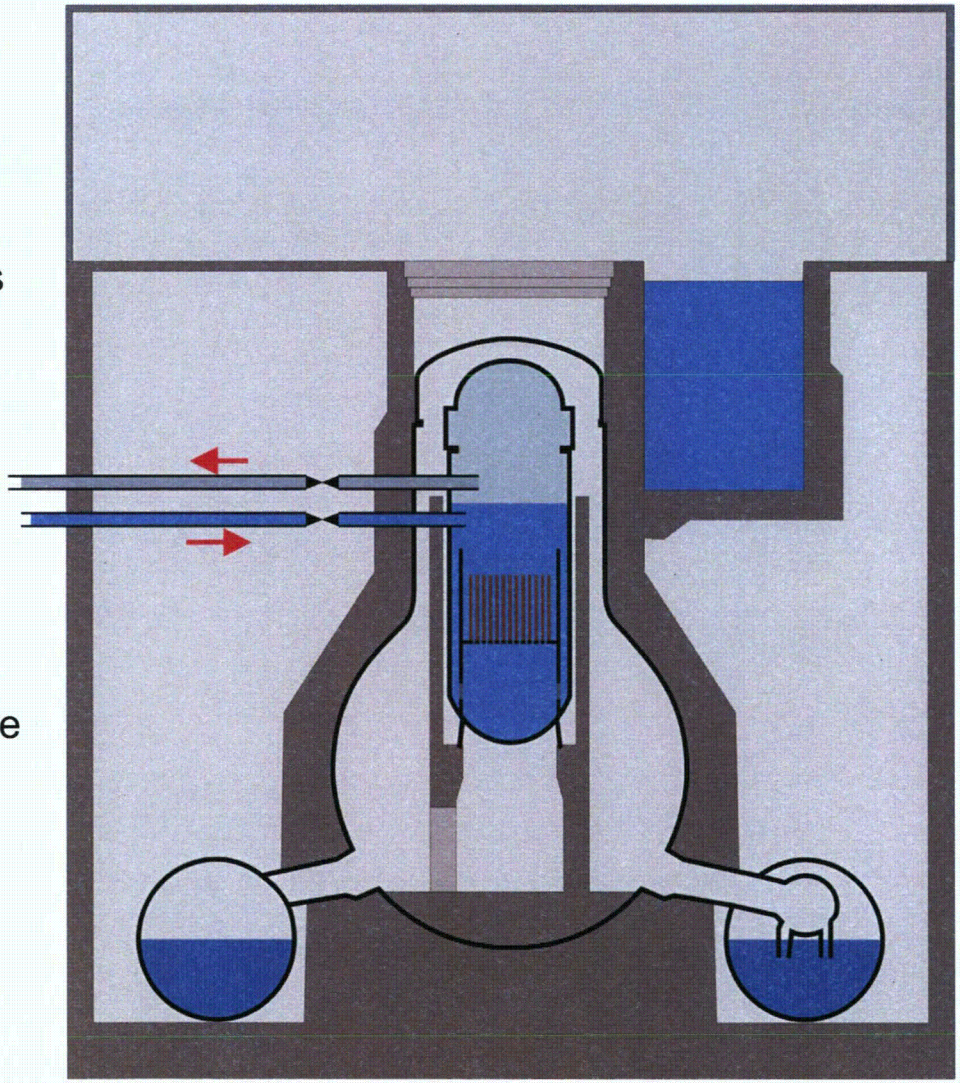
The Fukushima Daiichi Incident

2. Accident progression

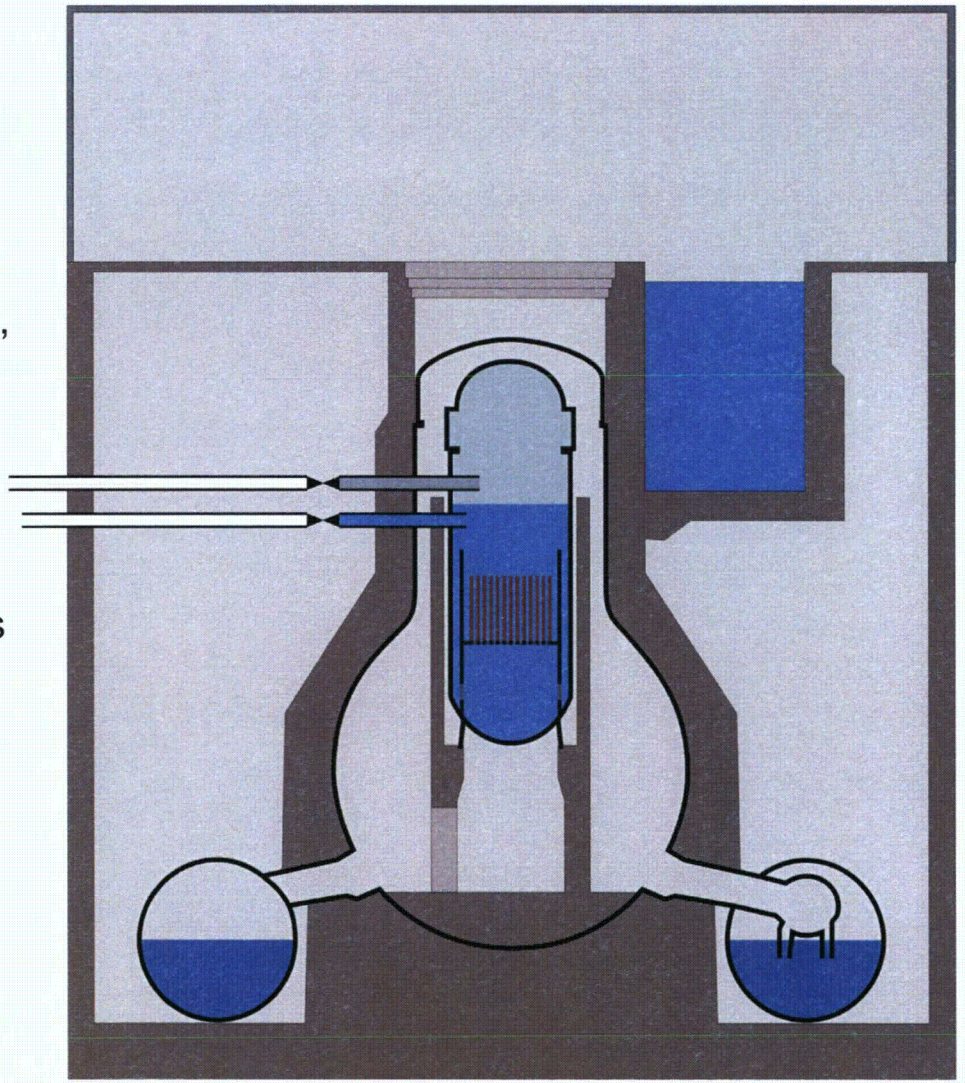
- 11.3.2011 14:46 - Earthquake
  - Magnitude 9
  - Power grid in northern Japan fails
  - Reactors itself are mainly undamaged
- SCRAM
  - Power generation due to Fission of Uranium stops
  - Heat generation due to radioactive Decay of Fission Products
    - After Scram ~6%
    - After 1 Day ~1%
   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



The Fukushima Daiichi Incident

2. Accident progression

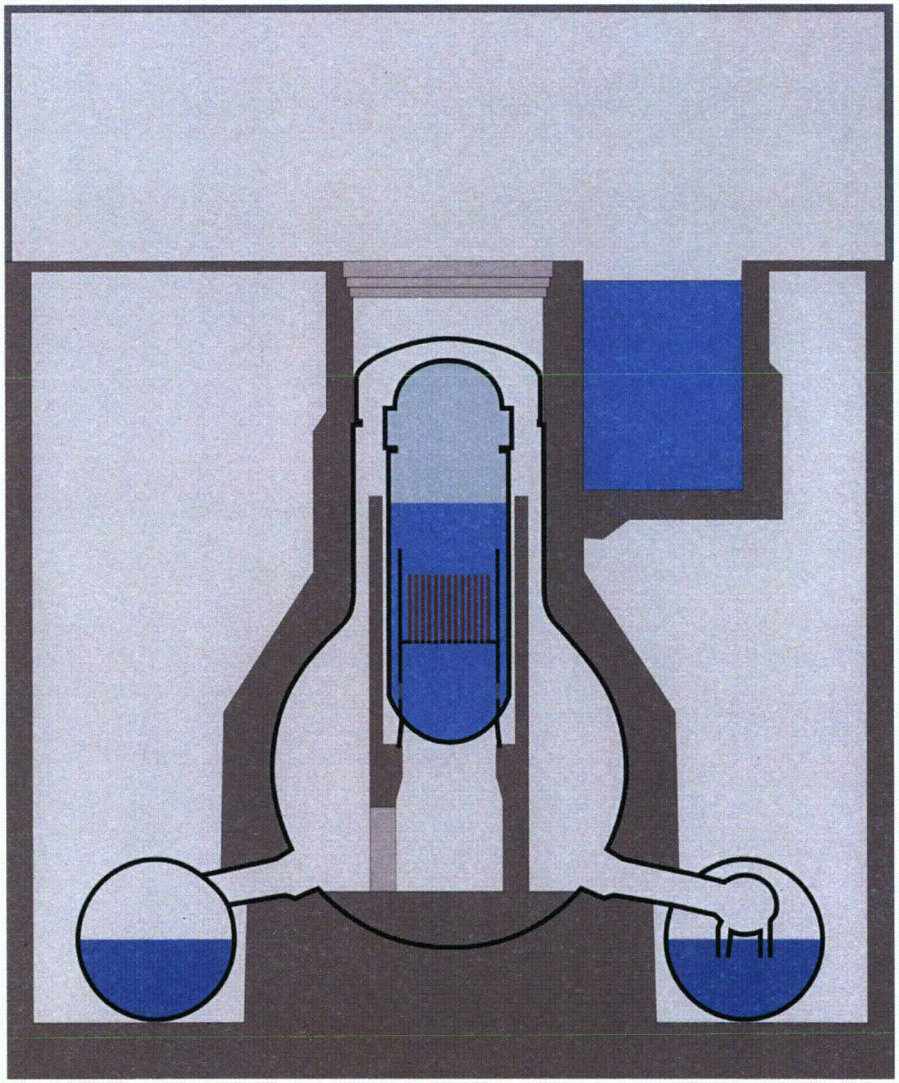
- Containment Isolation
  - Closing of all non-safety related Penetrations of the containment
  - Cuts off Machine hall
  - If containment isolation succeeds, a large early release of fission products is highly unlikely
- Diesel generators start
  - Emergency Core cooling systems are supplied
- Plant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



The Fukushima Daiichi Incident

2. Accident progression

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



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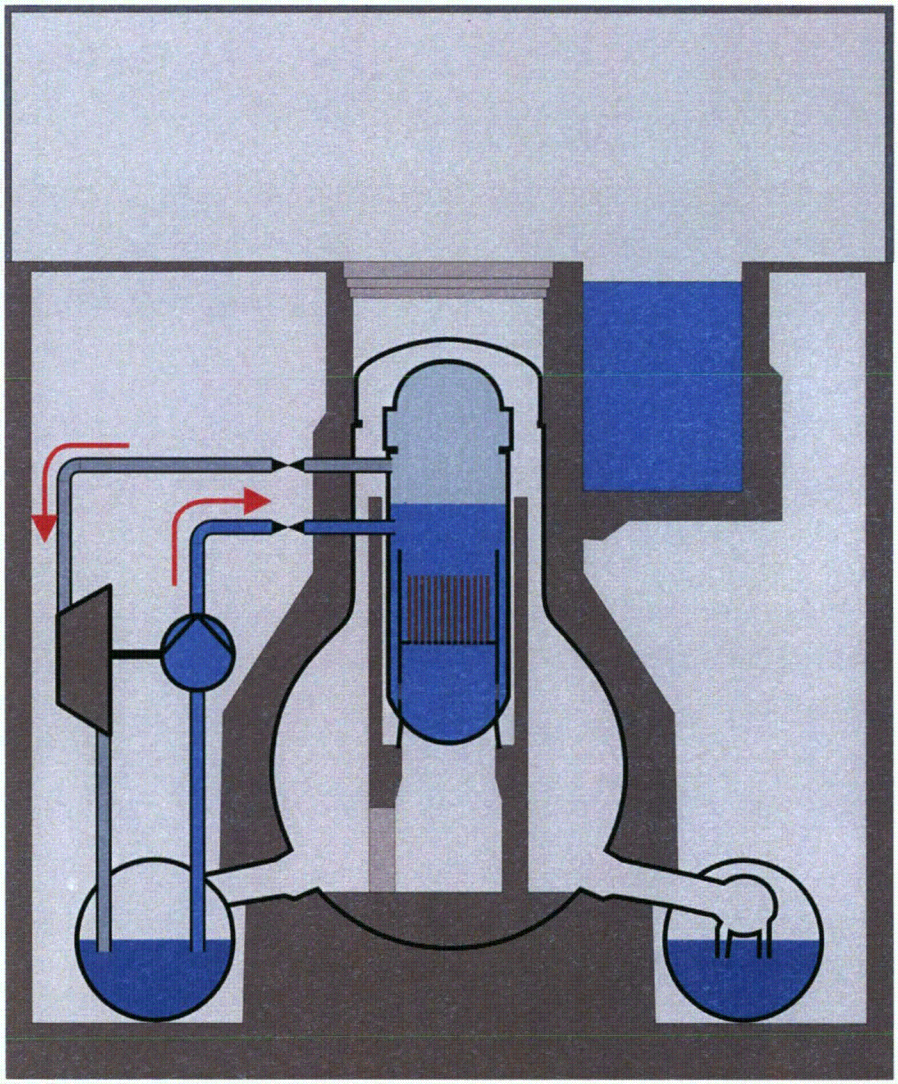
The Fukushima Daiichi Incident

2. Accident progression

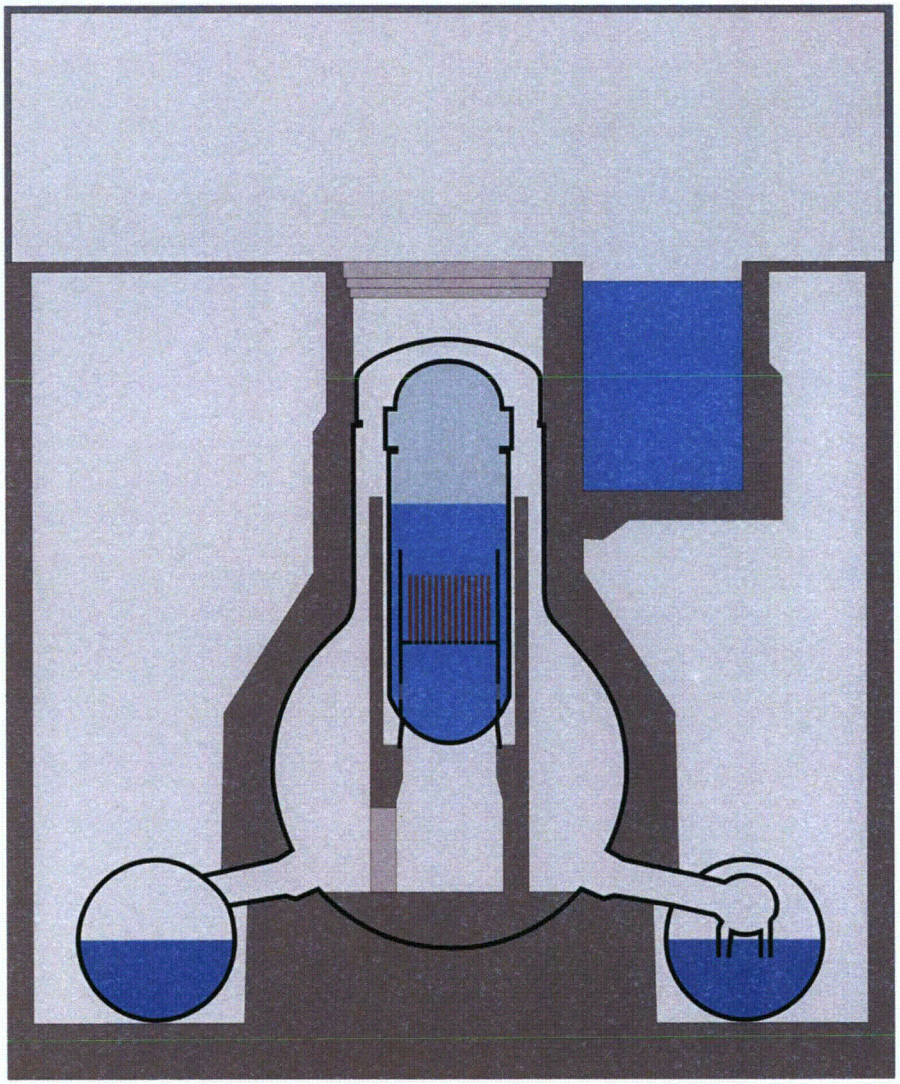
- Reactor Core Isolation Pump still available
  - Steam from the Reactor drives a Turbine
  - Steam gets condensed in the Wet-Well
  - Turbine drives a Pump
  - Water from the Wet-Well gets pumped in Reactor
  - Necessary:
    - Battery power
    - Temperature in the wet-well must be below 100°C
- As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



The Fukushima Daiichi Incident

2. Accident progression

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



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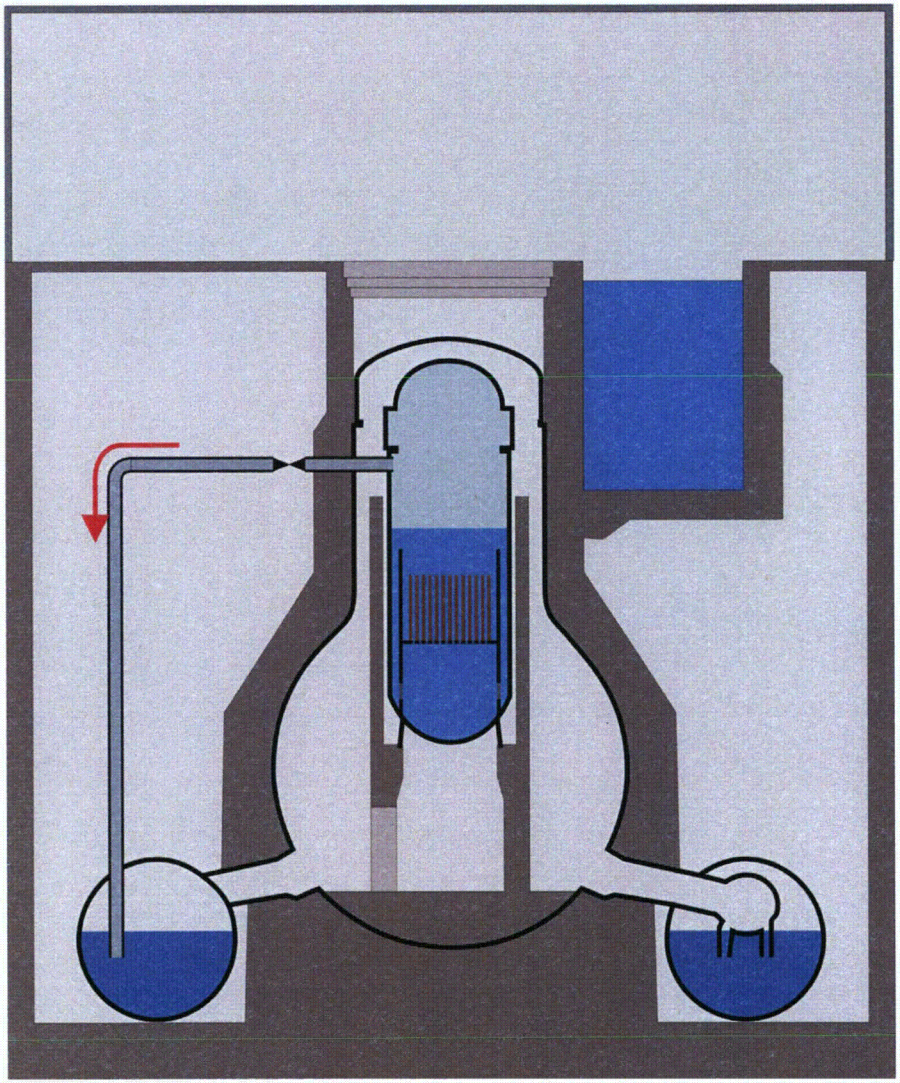

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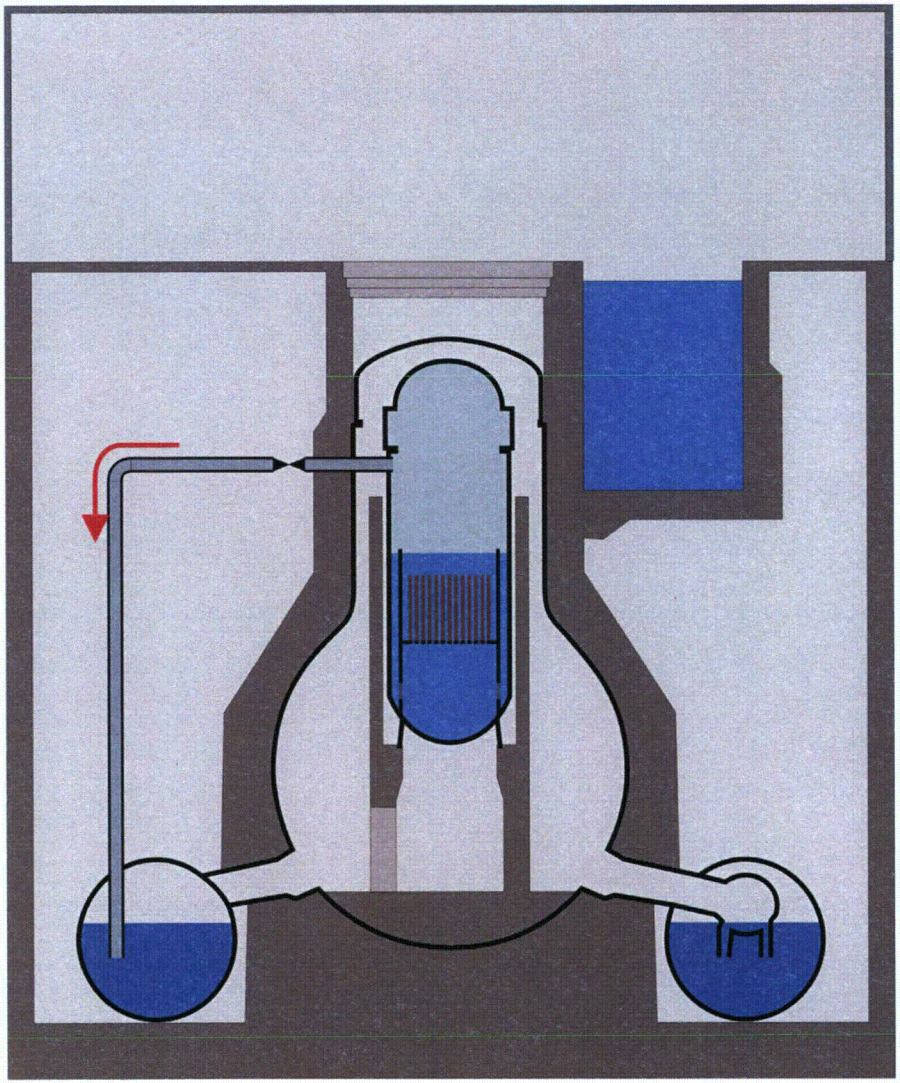

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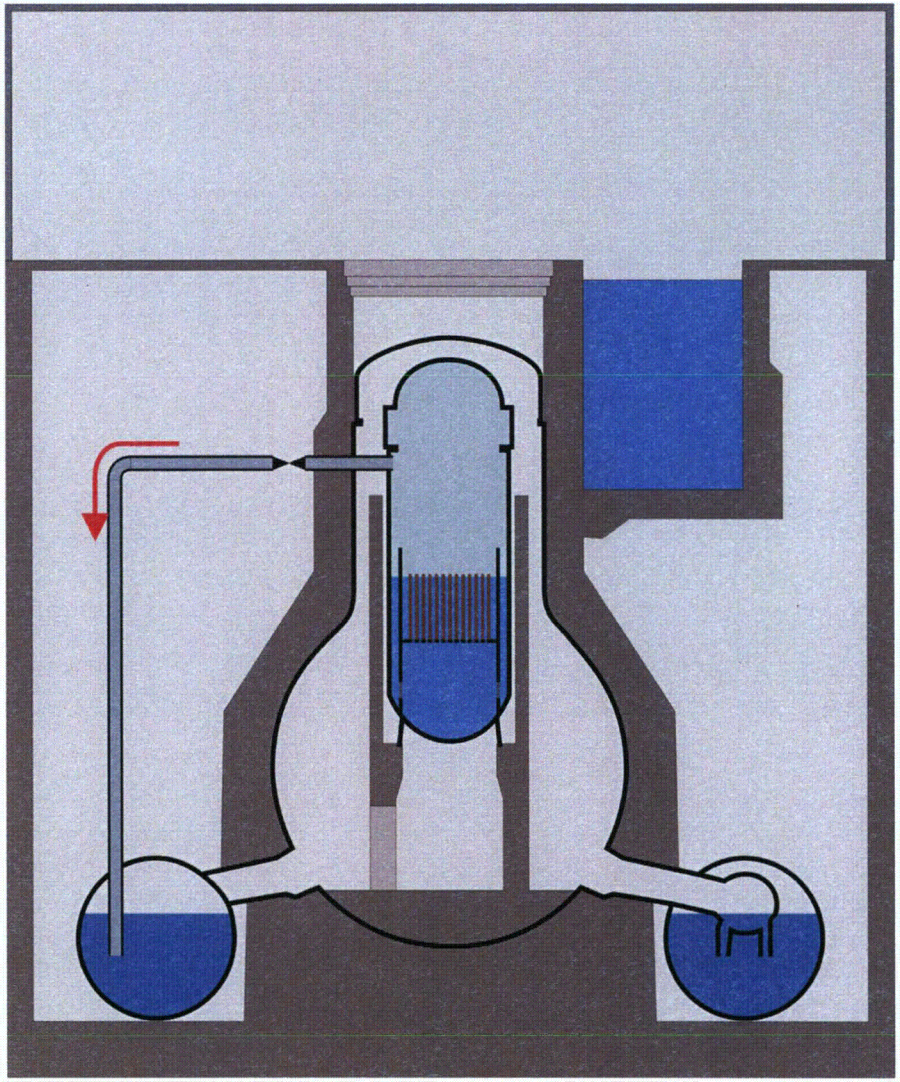

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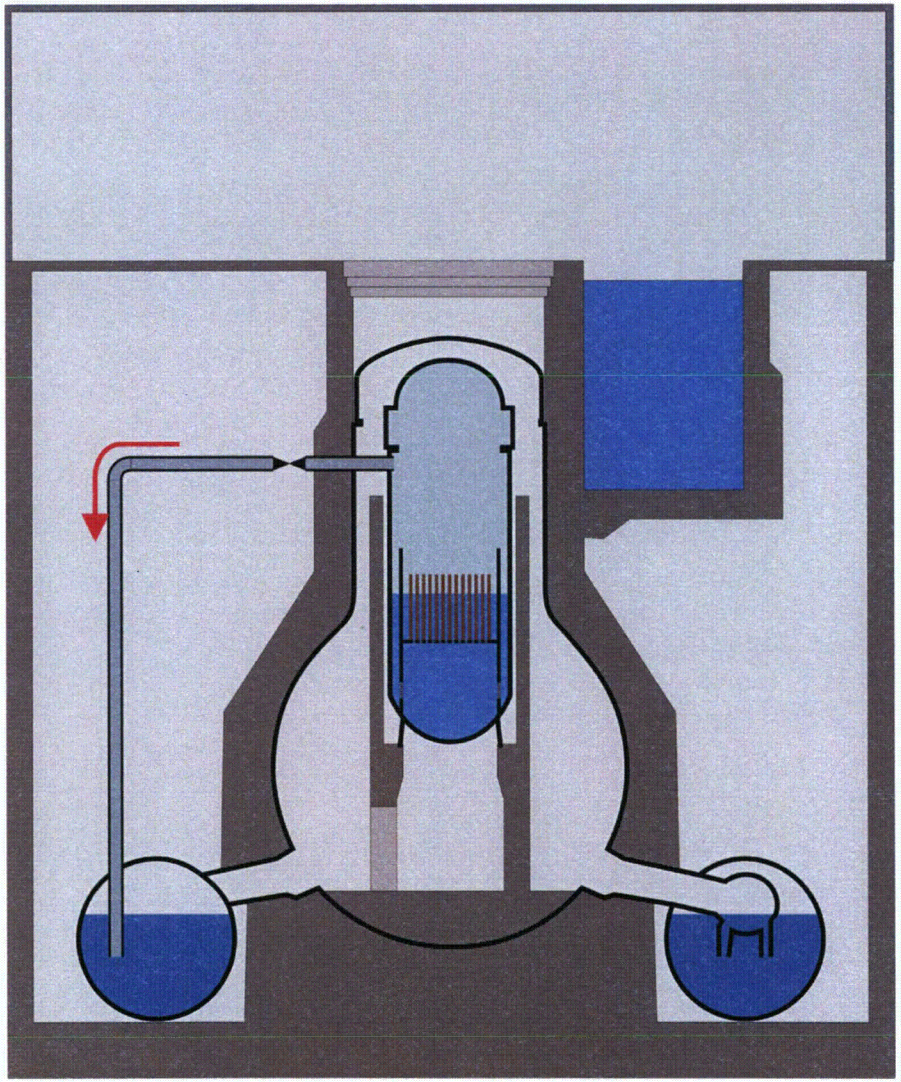

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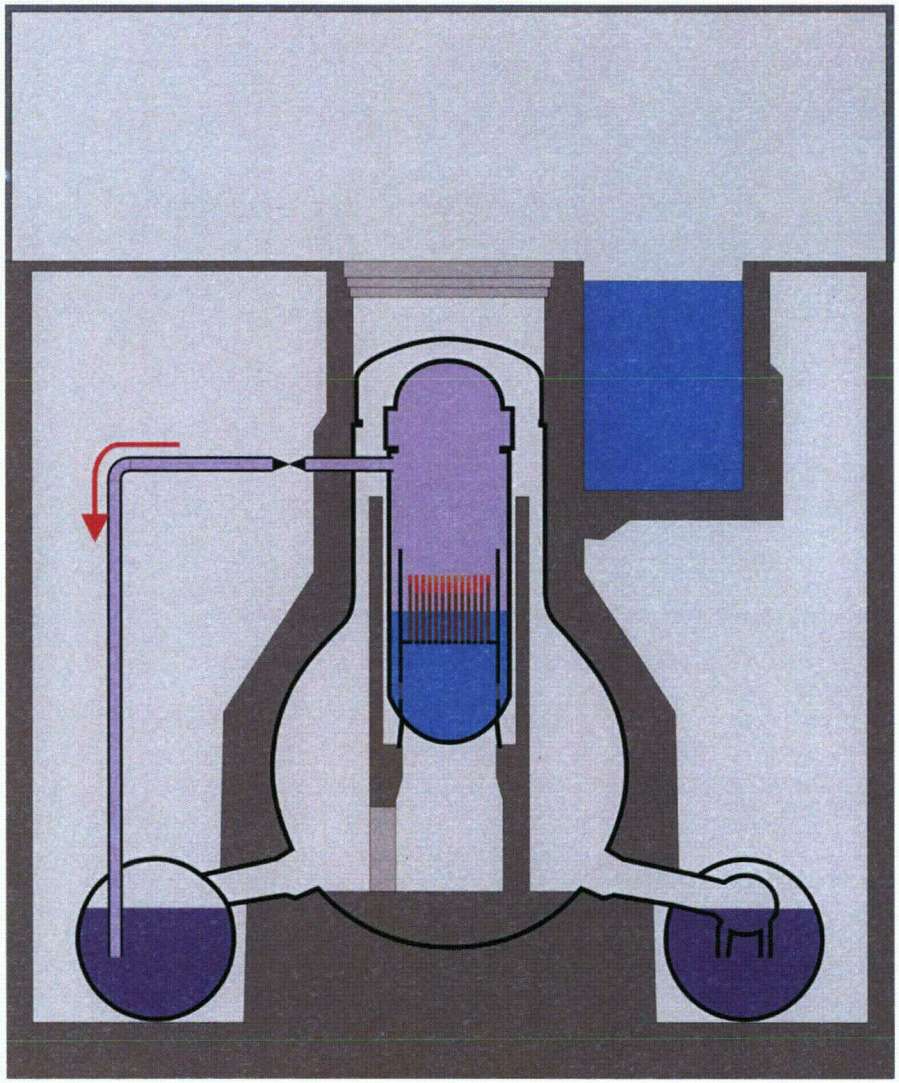
The Fukushima Daiichi Incident

2. Accident progression

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

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

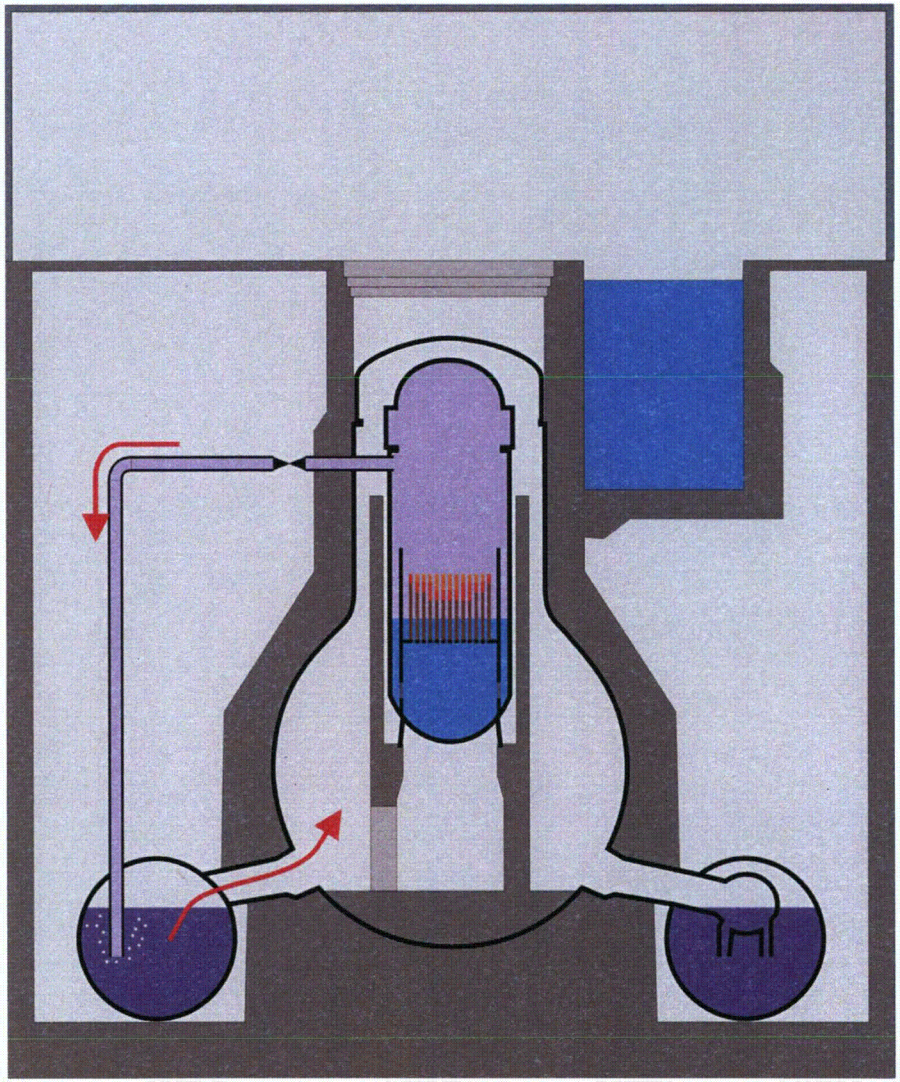
- ~2/3 of the core exposed
  - Cladding temperature exceeds ~900°C
  - Balooning / Breaking of the cladding
  - Release of fission products form the fuel rod gaps



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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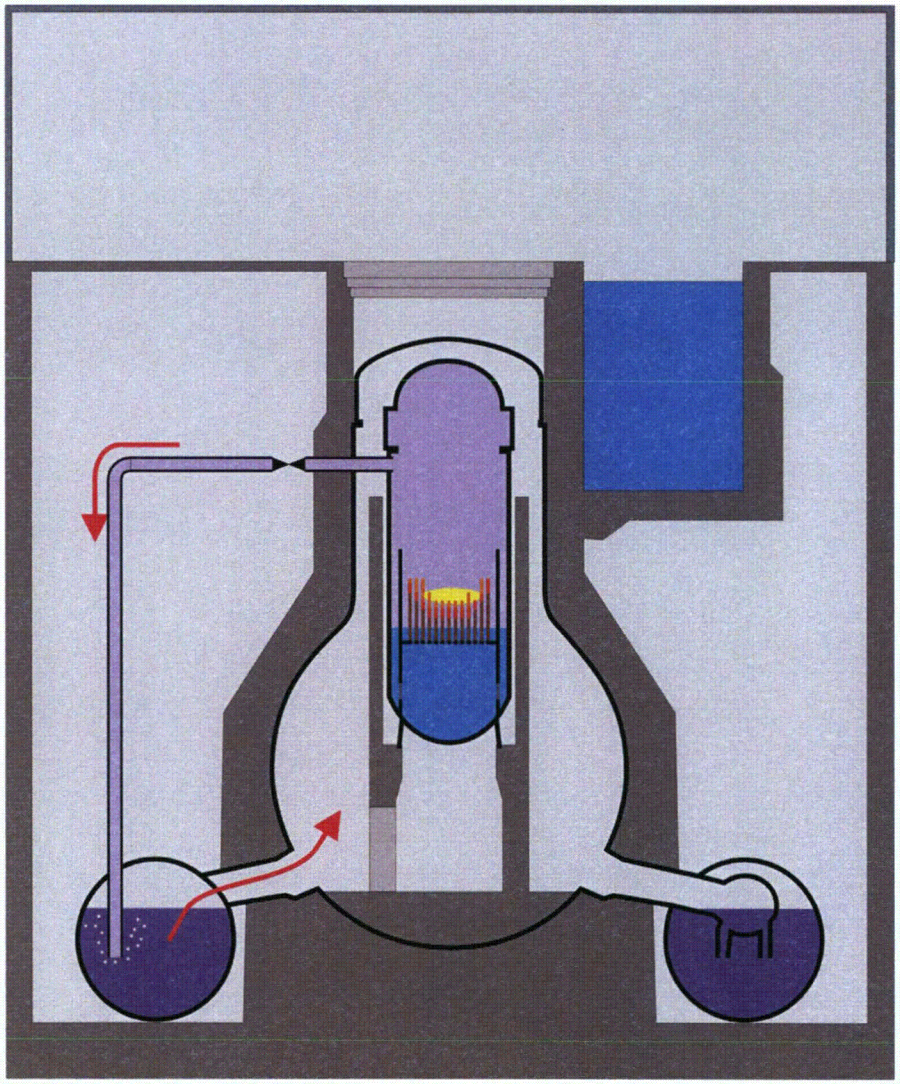
2. Accident progression

- 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)



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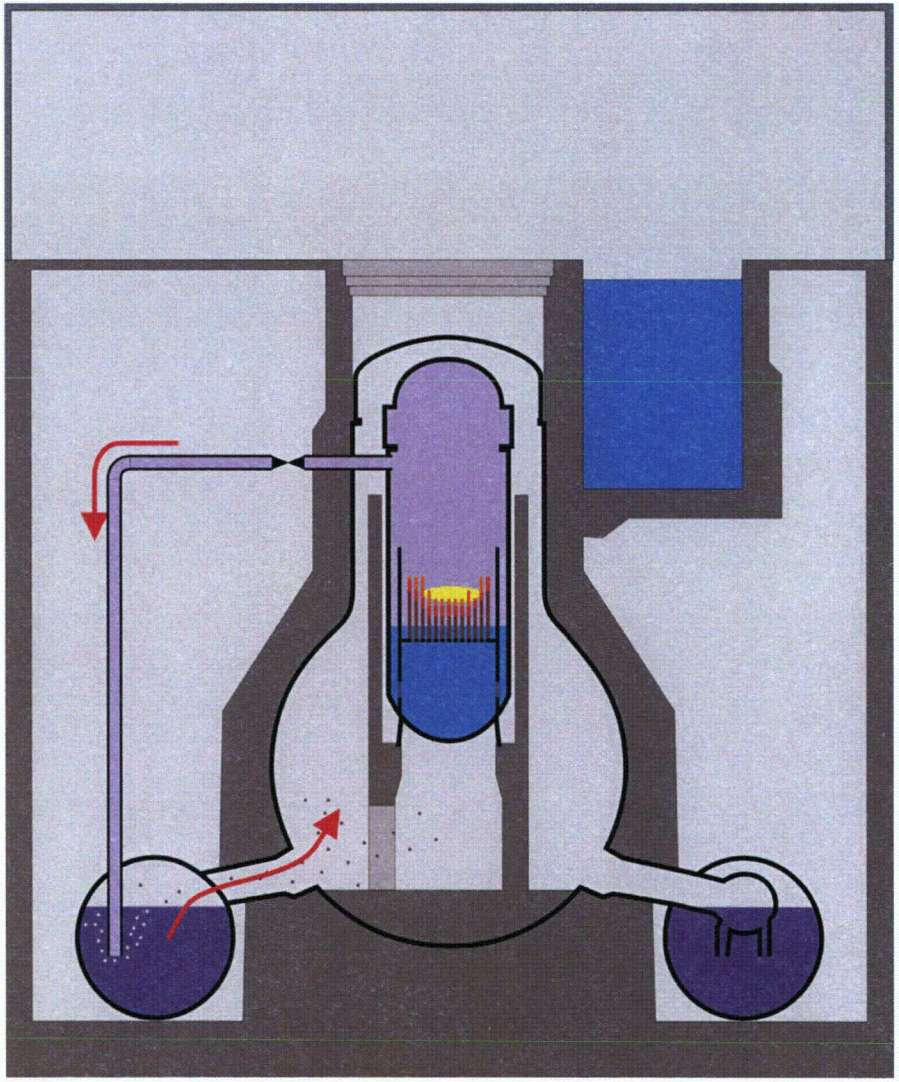
2. Accident progression

- 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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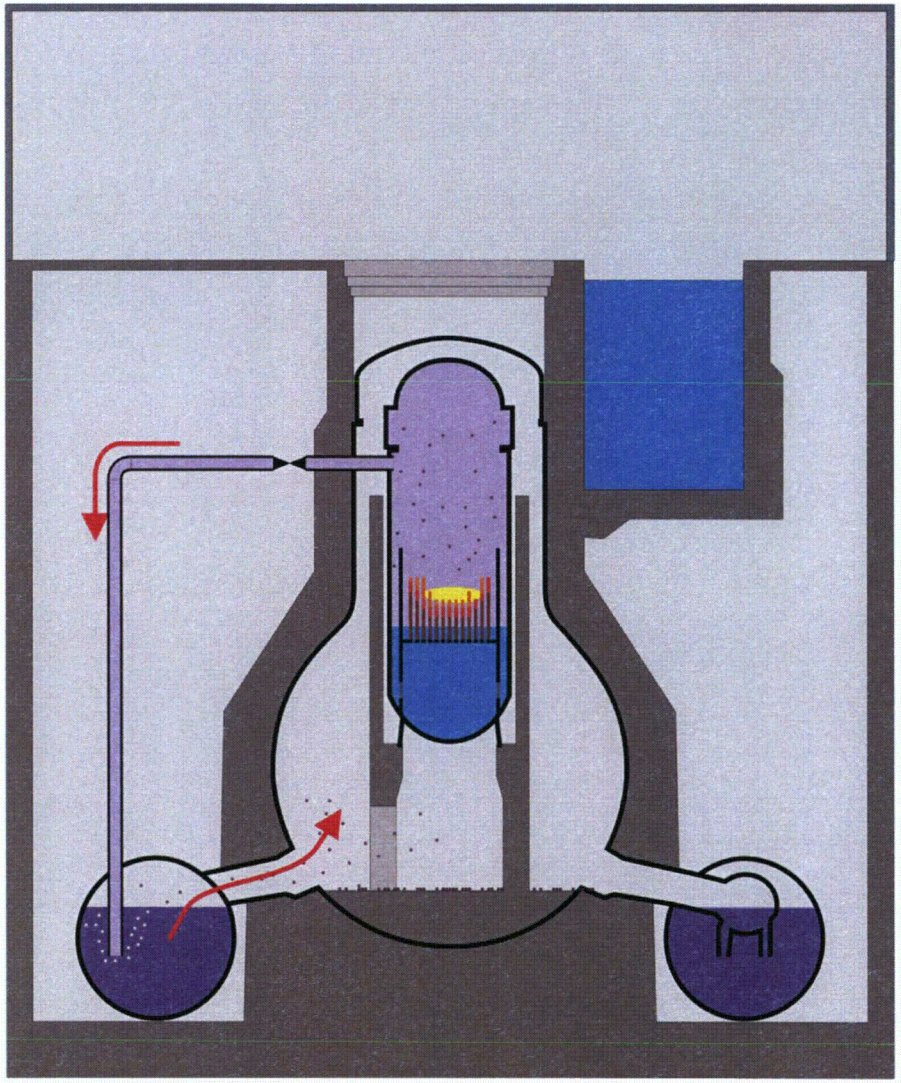
The Fukushima Daiichi Incident

2. Accident progression

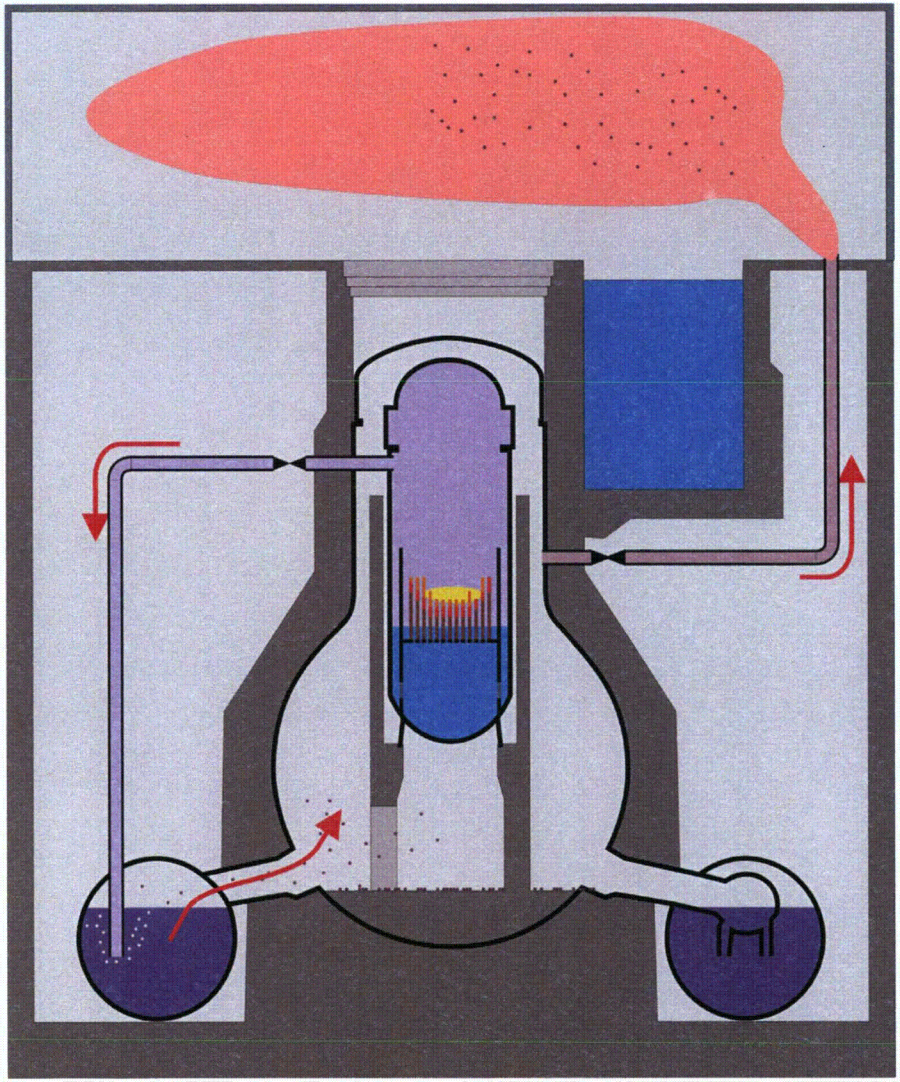
- Containment
  - Last barrier between Fission Products and Environment
  - Wall thickness ~3cm
  - Design Pressure 4-5bar
- Actual pressure up to 8 bars
  - Normal inert gas filling (Nitrogen)
  - Hydrogen from core oxidation
  - Boiling condensation chamber (like a pressure cooker)
- Depressurization 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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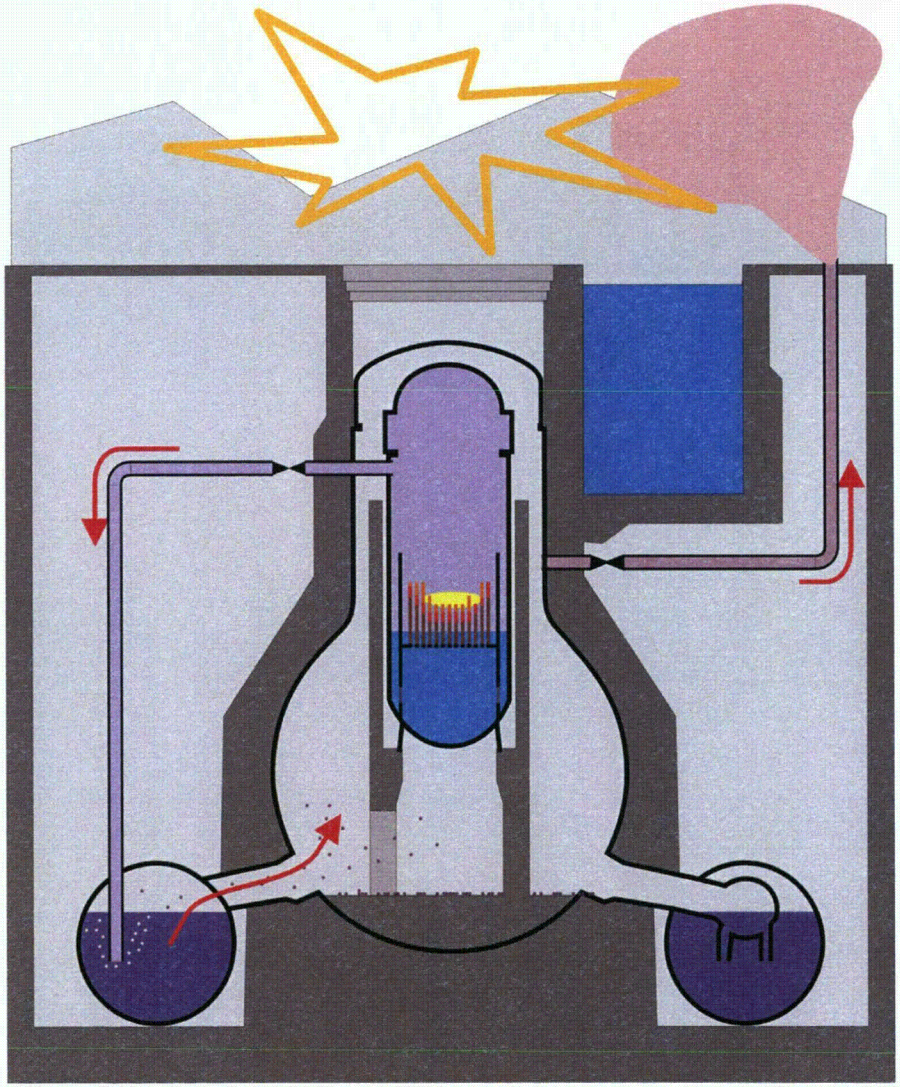
The Fukushima Daiichi Incident

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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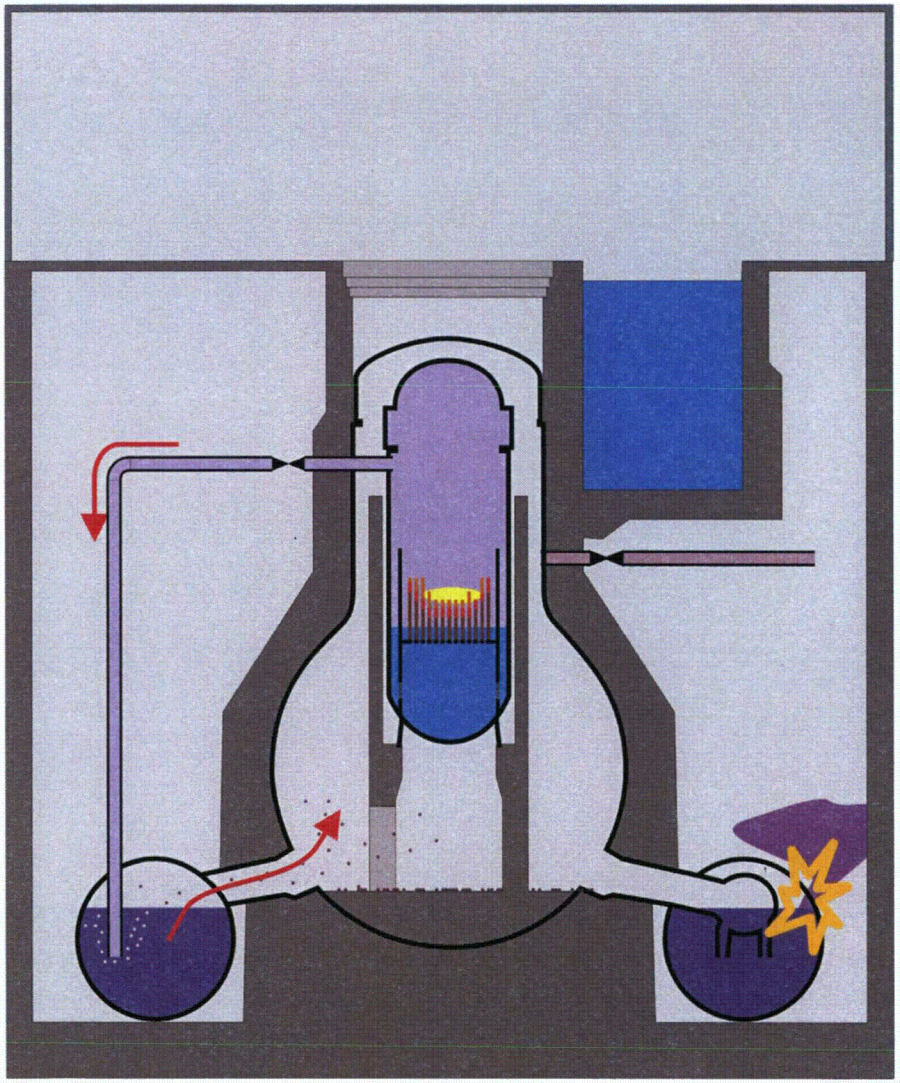
The Fukushima Daiichi Incident

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



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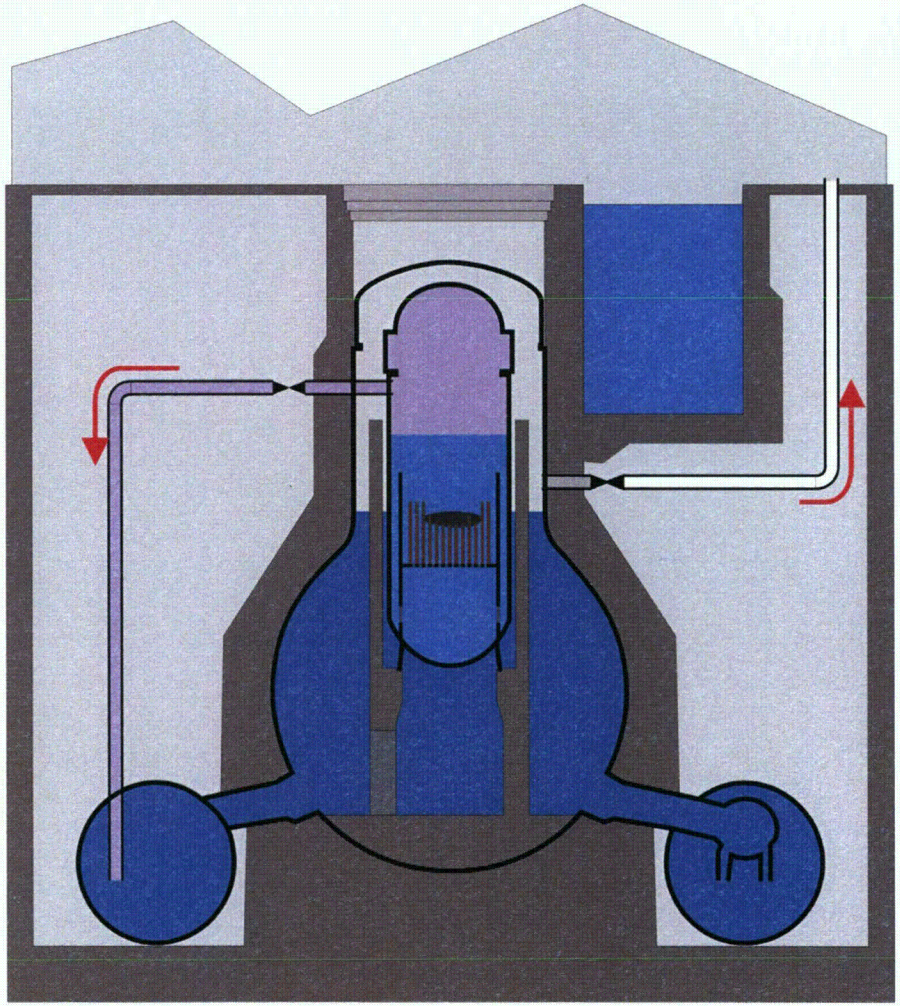
The Fukushima Daiichi Incident
2. Accident progression

- 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



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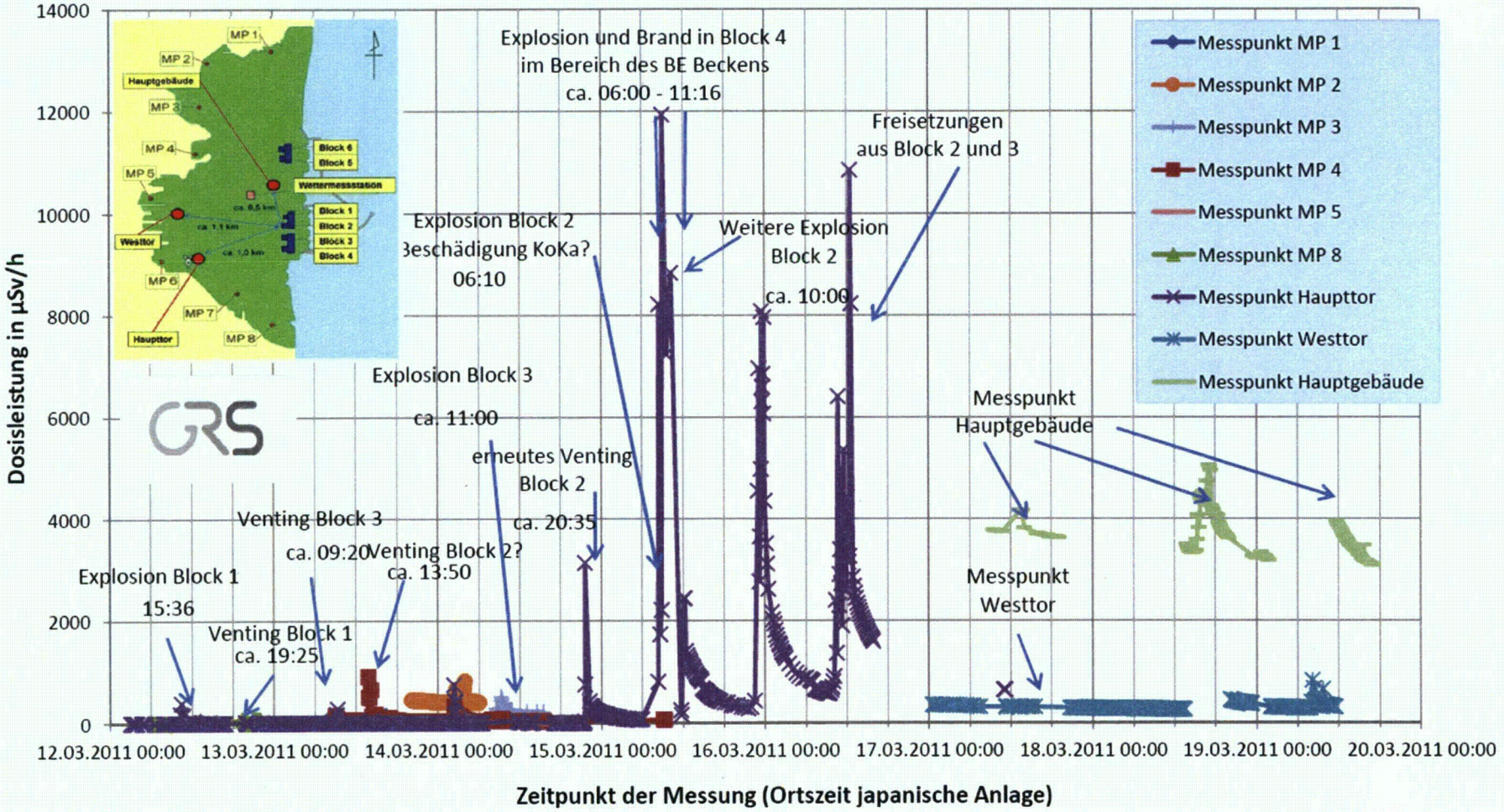
- Directly on the plant site
  - ◇ Before Explosion in Unit Block 2
    - Below 2mSv / h
    - Mainly due to released radioactive noble gases
    - Measuring posts on west side. Maybe too small values measured due to wind
  - ◇ After Explosion in Unit 2 (Damage of the Containment)
    - Temporal peak 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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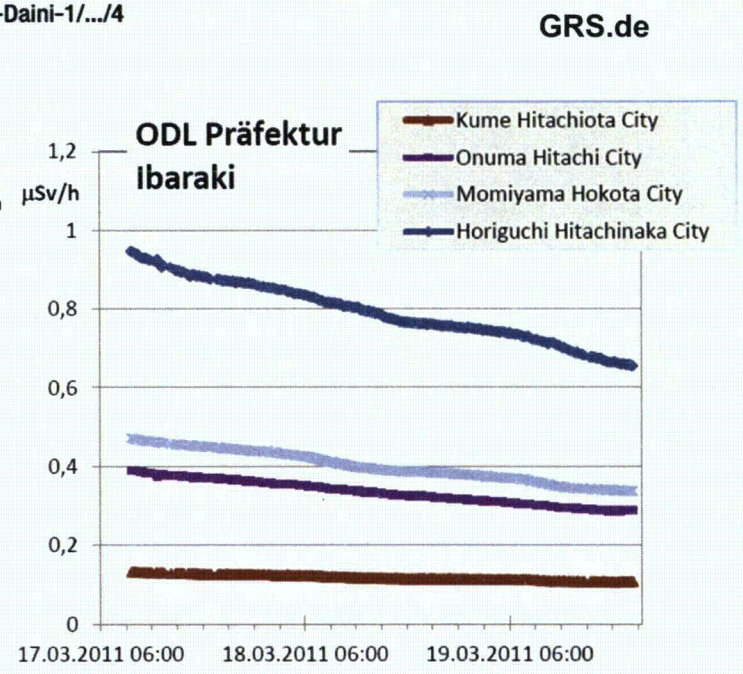
- Outside the Plant site
  - As reactor building mostly intact
    => reduced release of Aerosols (not Chernobyl-like)
  - Fission product release in steam
    => fast Aerosol grows, large fraction falls down in the proximity of the plant
  - Main contribution to the radioactive dose outside plant are 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



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

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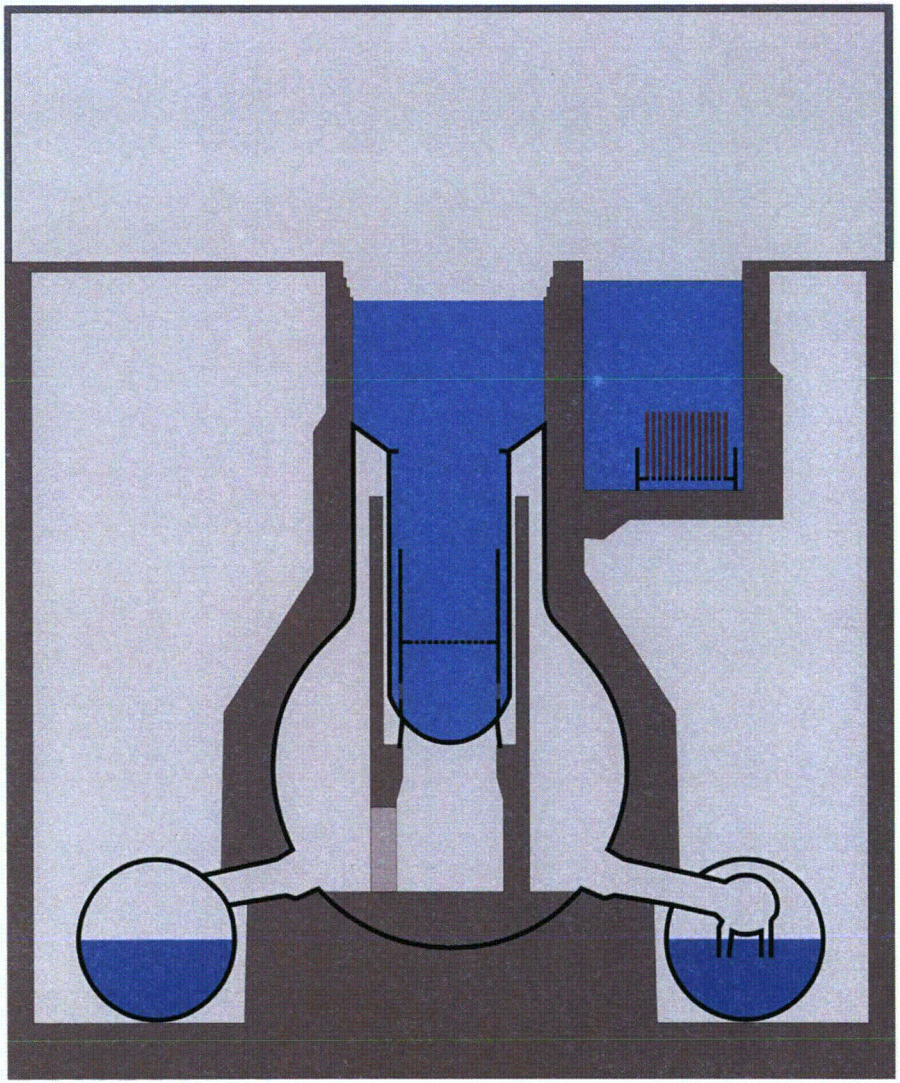
The Fukushima Daiichi Incident

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



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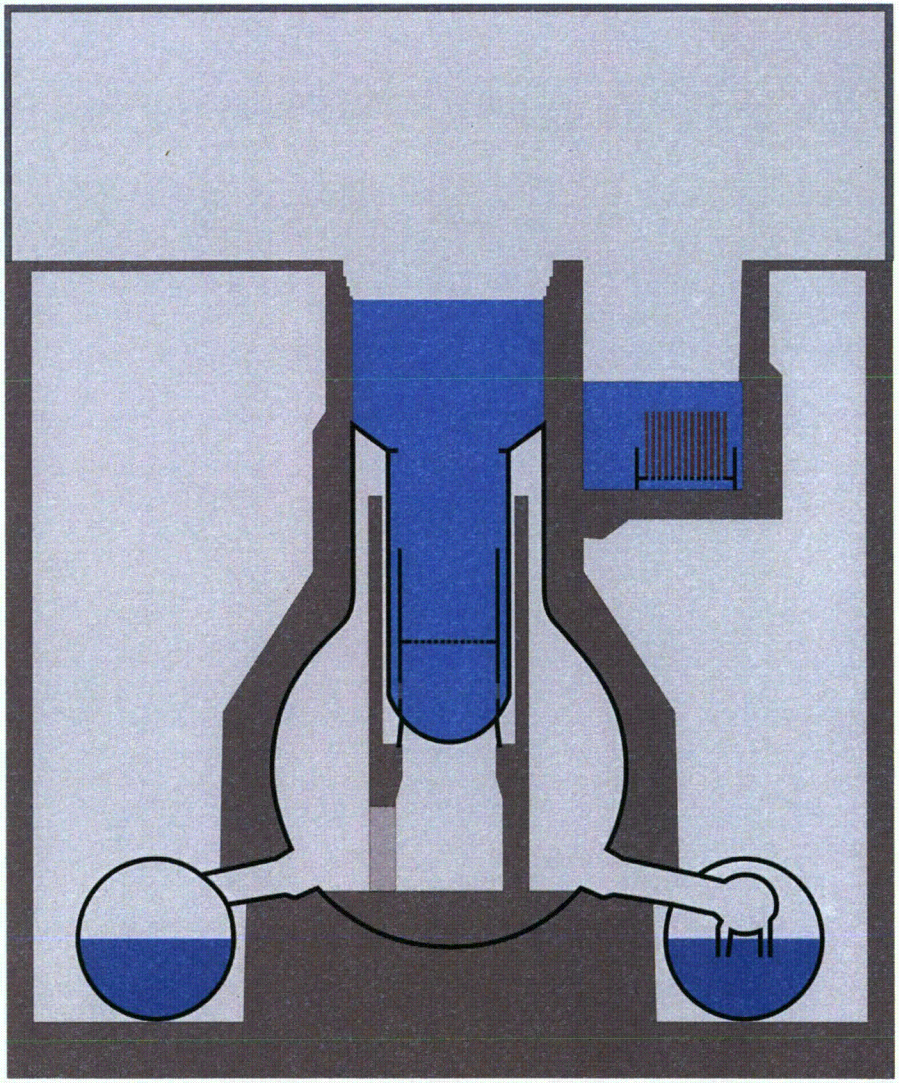

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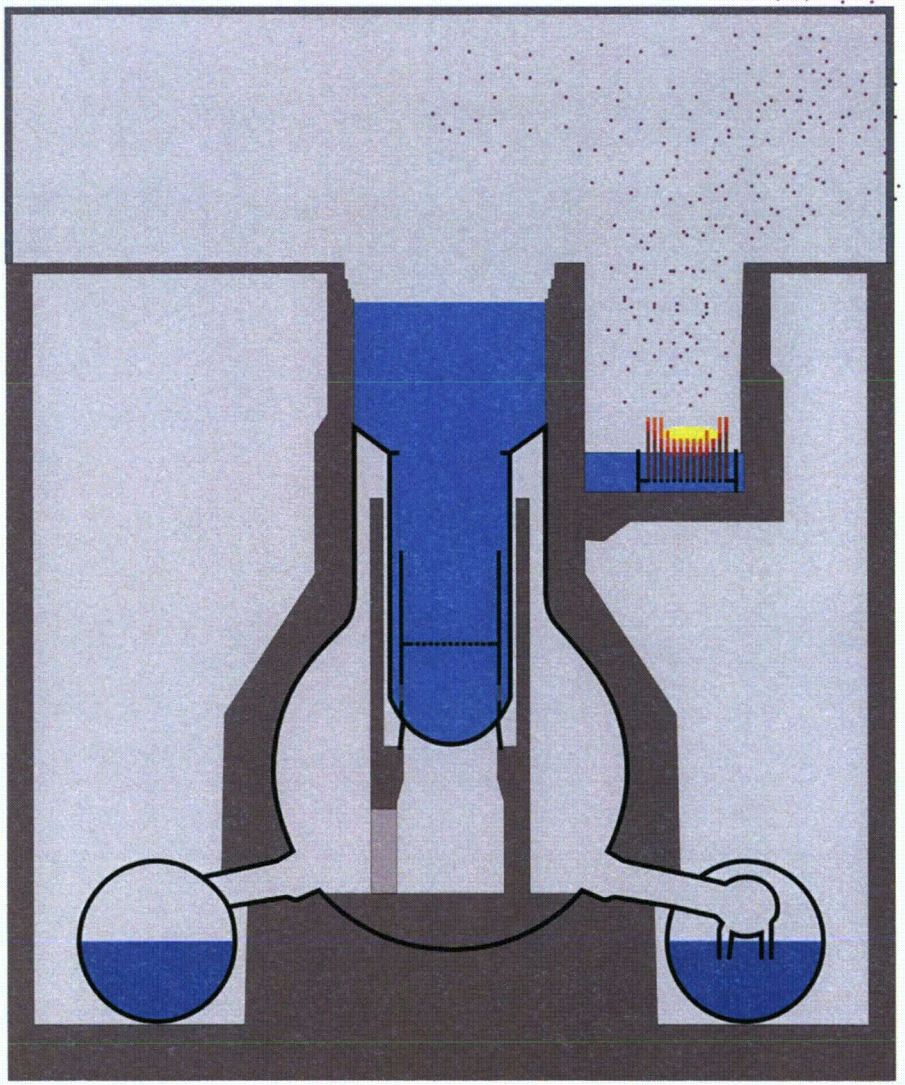
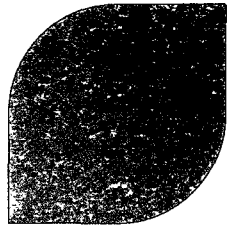
  - Large release
- **It is currently unclear if release from fuel pool already happened**





- 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

News Release

経済産業省
Ministry of Economy, Trade and Industry

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

Search

Press Releases

Press Release (Mar 26,2011)
Detection of radioactive materials from the seawater around the discharge canal of Fukushima Daiichi Nuclear Power Station (6th release)

On March 21st 2011, radioactive materials were detected from the seawater around the discharge canal (south) of Fukushima Daiichi Nuclear Power Station which was damaged by the 2011 Tohoku-Taiheiyou-Oki Earthquake. This is the result of the sampling survey of radioactive materials in the seawater which was implemented as a part of monitoring activity of surrounding environment. We had informed the result to Nuclear and Industrial Safety Agency (NISA) and Fukushima prefecture.
(previously announced)

On March 25th 2011, we had conducted re-sampling survey to examine the effect of radioactive materials in the seawater. Today, we had informed the result to Nuclear and Industrial Safety Agency (NISA) and the government of Fukushima Prefecture, because radioactive materials were detected as shown in the attachment.

We will continue to conduct same kind of sampling survey.

attachment1:The result of the nuclide analysis of the seawater (Around the discharge canal (south) of Fukushima Daiichi Nuclear Power Station)(PDF 7.75KB)
attachment2:The result of the nuclide analysis of the seawater (Around the discharge canal (north) of Units 5 and 6 Fukushima Daiichi Nuclear Power Station) (PDF 7.69KB)
attachment3:The result of the nuclide analysis of the seawater (Around the discharge canal (north) of Units 3 and 4 of Fukushima Daini Nuclear Power Station) (PDF 7.610KB)
attachment4:The result of the nuclide analysis of the seawater (Around Iwasawa Coast) (PDF 30.5KB)
attachment5:Radioactivity Density of Seawater(PDF 39.6KB)

back to page top

000157

Search

Press Releases

Press Release (Mar 26,2011)
Plant Status of Fukushima Daini Nuclear Power Station (as of 9:00 am March 26th)

[No update from the last release issued at 9:00 pm, March 25th]

Unit Status

1
- Reactor cold shutdown, stable water level, offsite power is available.
- No reactor coolant is leaked to the reactor containment vessel.
- Maintain average water temperature at 100°C in the Pressure Suppression Chamber.

2
- Reactor cold shutdown, stable water level, offsite power is available.
- No reactor coolant is leaked to the reactor containment vessel.
- Maintain average water temperature at 100°C in the Pressure Suppression Chamber.

3
- Reactor cold shutdown, stable water level, offsite power is available.
- No reactor coolant is leaked to the reactor containment vessel.
- Maintain average water temperature at 100°C in the Pressure Suppression Chamber.

4
- Reactor cold shutdown, stable water level, offsite power is available.
- No reactor coolant is leaked to the reactor containment vessel.
- Maintain average water temperature at 100°C in the Pressure Suppression Chamber.

Other N.A.

back to page top

Q22 / 158

Search

Press Releases

Press Release (Mar 26,2011)
The results of nuclide analyses of radioactive materials in the air at the site of Fukushima Daiichi Nuclear Power Station (5th release)

On March 22nd 2011, as part of monitoring activity of the surrounding environment, we conducted nuclide analysis of radioactive materials contained in the air which were collected on March 20th and 21st 2011 at the site of Fukushima Daiichi Nuclear Power Station, which was damaged by Tohoku-Chihou-Taiheiyo-Oki Earthquake. As a result, radioactive materials were detected as shown in the attachment. Therefore, we summarized the results and reported them to Nuclear and Industry Safety Agency as well as to the government of Fukushima Prefecture today. (previously announced)

On March 25th, 2011, we conducted nuclide analysis of radioactive materials contained in the air which were collected on March 25th, 2011 at the site of Fukushima Daiichi Nuclear Power Station. As a result, radioactive materials were detected as shown in the attachment. Therefore, we summarized the results and reported them to Nuclear and Industry Safety Agency as well as to the government of Fukushima Prefecture today.

We will continue the sampling survey same as this one.

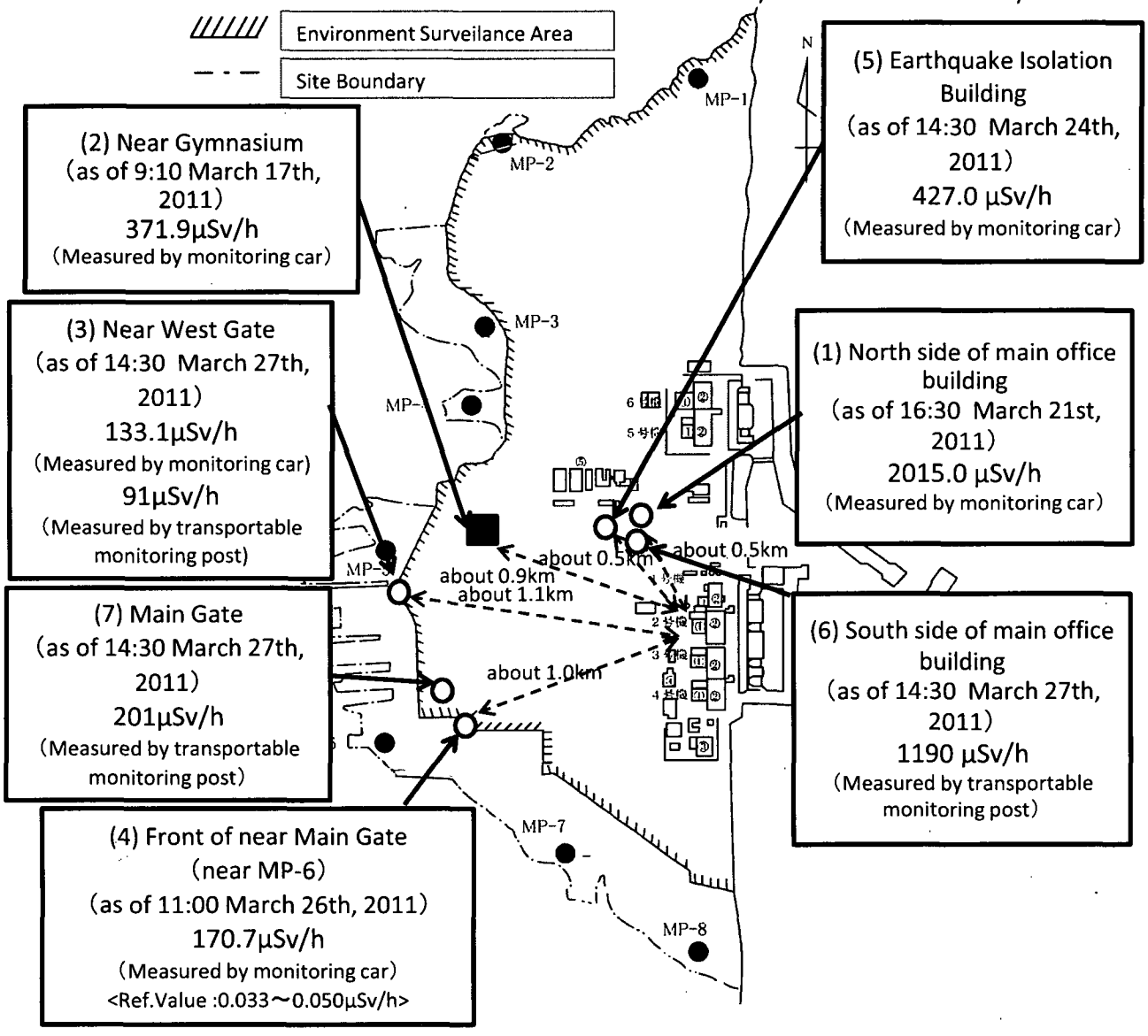
attachment1:The result of the nuclide analysis of radioactive materials in the air at the site of Fukushima Daiichi Nuclear Power Station(PDF 12.6KB)
attachment2:The result of the nuclide analysis of radioactive materials in the air at the site of Fukushima Daini Nuclear Power Station(PDF 13.8KB)
attachment3:Nuclide analysis of radioactive materials in the air Fukushima Daiichi uclear Power Station(Main Gate) (PDF 12.5KB)
attachment4:Nuclide analysis of radioactive materials in the air Fukushima Daini Nuclear Power Station(MP-1)(PDF 13.6KB)

back to page top

000159

Fukushima Dai－ichi NPS

as of 17:30, March 27th, 2011



From: Blount, Tom
Sent: Sunday, March 27, 2011 12:27 PM
To: ET07 Hoc
Subject: FW: 03-27-0900 spent fuel storage safety_RST_0327_0900FINALVERSION.docx
Attachments: 03-27-0900 spent fuel storage safety_RST_0327_0900FINALVERSION.docx

Here is the current with Josh's comments

From: ET05 Hoc
Sent: Sunday, March 27, 2011 11:24 AM
To: Blount, Tom
Subject: 03-27-0900 spent fuel storage safety_RST_0327_0900FINALVERSION.docx

0001 161

SPENT FUEL STORAGE SAFETY

Overview

Spent fuel is nuclear reactor fuel that has been used to generate power in the reactor. Immediately after discharge from the reactor during refueling, spent fuel must be stored wet in storage pools for at least three years until it is sufficiently cool to permit dry storage in casks. Interim storage of spent fuel in wet or dry storage systems is safe and presents low risk to the public. Both storage methods are robust designs that are manufactured to high quality standards, and are designed and built using numerous industry codes and standards. Therefore, NRC regulations permit either method to be used for interim storage of spent fuel. There is a significant experience base in the U.S. and abroad with the safe storage of spent fuel.

Since the terrorist events of September 11, 2001, the NRC staff has augmented the safety and security requirements for storage locations of nuclear materials including spent nuclear fuel. Evaluations and assessments performed by the NRC staff show that the likelihood of a physical attack on dry storage casks or spent fuel pools that would result in a significant radiological release is extremely low. Extensive security measures required by NRC protect against radiological sabotage or theft and diversion of radioactive material. The NRC has specific regulatory requirements for the physical protection of commercial spent fuel. In addition, NRC maintains a threat assessment capability that works in collaboration with federal law enforcement and intelligence agencies.

Spent Fuel Storage

Dry storage is achieved by placement of the spent fuel in above-ground structures. Dry cask storage allows spent fuel that has already been cooled in the spent fuel pool for at least three years to be surrounded by an inert gas inside a container called a cask. The casks are typically steel cylinders that are either welded or bolted closed. The steel cylinder is typically 1-inch-thick steel, with a welded lid that is 8 to 10 inches of steel, a bottom flange that is 6 inches of steel, and provides a leak-tight containment of the spent fuel. The steel canister is then placed in a storage overpack that consists of 8 to 10 inches of steel or several feet of concrete (2 to 3 feet). The natural flow of air through the casks provides adequate cooling for the spent fuel inside.

Currently there are 63 independent spent fuel storage installation (ISFSI) licensees located at 57 facilities in the United States. There are over 1400 loaded storage casks in these facilities, mostly at active or decommissioned reactor sites.

Wet storage is achieved by the use of spent fuel pools. The spent fuel pool structures are constructed with thick reinforced concrete walls and floor slabs lined with seam-welded stainless steel plate (1/8 to 1/4 inch thick). Pool walls are about 4 to 5 feet thick, and the pool floor slabs are about 4 to 6 ft thick. The typical pool dimensions are about 40 feet long, 35 feet wide and 40 feet deep, but pool lengths and widths vary widely because of varying design considerations.

In the United States there are 23 boiling water reactor (BWR) plants with Mark I containment designs similar to the Fukushima Daiichi Units 1-5, and eight Mark II containment designs similar to Fukushima Daiichi Unit 6. The spent fuel pool structures are located in the reactor building at an elevation several stories above the ground (about 50 to 60 feet above ground for the Mark I reactors). The remaining spent fuel pools at operating reactors are typically located with the bottom of the pool at or below plant grade level. The robust construction provides the potential for the structure to withstand events well beyond those considered in the original design.

Spent Fuel Storage Regulation

The regulations in Title 10 of the *Code of Federal Regulations* (10 CFR), including Appendix A, "General Design Criteria for Nuclear Power Plants," 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," or 10 CFR Part 72, "Licensing requirements for the independent storage of spent nuclear fuel and high-level radioactive waste, and reactor-related greater than Class C waste," contain design criteria for both wet and dry storage to ensure that fuel storage and handling systems provide adequate safety under anticipated operating and accident conditions.

The design criteria include requirements for: radiation shielding; confinement; residual heat removal capability consistent with its importance to safety; and maintaining the fuel in a subcritical configuration. Additional design criteria specify requirements for: protection against natural phenomena, such as seismic events, tornados, and flooding (tsunamis, hurricanes, seiches, and potential dam failures); protection against dynamic effects, such as flying debris resulting from equipment failure and drops of fuel storage and handling equipment resulting from either human error or equipment failure. Additionally, spent fuel storage facilities are evaluated against hazards to the storage site from nearby activities.

Inspections and Oversight

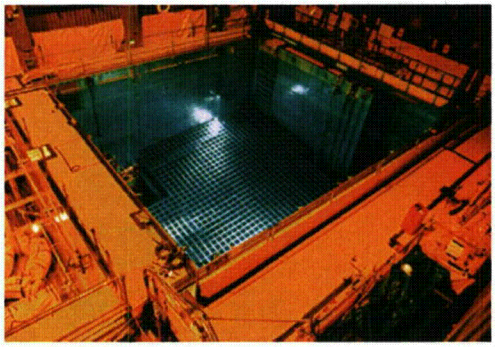
The NRC has established inspection activities to verify that spent fuel pool design features, operational controls, and security are maintained at each facility consistent with its license. Refueling practices, including spent fuel pool operations, are inspected each refueling. In addition, the NRC implemented special inspection activities to verify proper implementation of new spent fuel cooling capabilities and changes in operating practices.

NRC's regulatory program includes oversight of the independent review and certification of dry cask designs and on-site inspection of cask designers, fabricators, and licensees to ensure compliance with NRC storage regulations, certificates of compliance for each NRC-approved storage system requires that the general licensee perform internal demonstrations of all activities needed safely load a cask in the pool and transfer it to the storage pad, as well as the reverse in the event a loaded cask has to be unloaded and its fuel returned to the pool. NRC inspectors with specific knowledge of ISFSI operations observe and assess the adequacy of the licensee's demonstrations (usually referred to as the NRC-observed dry run) and these inspectors observe all initial cask loadings. Subsequent loadings may be observed by regional inspectors or the on-site resident inspectors. The regional offices also perform periodic inspections of routine ISFSI operations.

Spent Fuel Pool Design

Protection against Natural Phenomena and Dynamic Effects

The spent fuel pool structures (walls, floor slabs and supports) for all operating reactors are designed to seismic standards consistent with other important safety-related structures on the site. The storage racks supporting the stored fuel are also designed to maintain the design storage configuration following a seismic event. The spent fuel pool and its supporting systems are located within structures that provide appropriate protection against natural phenomena and dynamic effects. The large inventory of water maintained over the stored fuel, typically more than 20 feet above the top of the spent fuel rods, provides substantial protection itself by absorbing the energy of likely flying debris that may enter the pool through the surface. The thick walls and floor slabs have been evaluated to maintain structural integrity and protect the fuel from impact by flying debris resulting from postulated equipment failures and natural phenomena.



Maintenance of Water Inventory

The stainless-steel-lined spent fuel pool structure protects against a substantial loss of inventory. Piping which enters the pool structure is typically above the stored fuel, and with few exceptions, the operating reactor pool structures have been designed with no penetrations below the top of the stored fuel. The only exceptions are small lines used to detect liner leakage that have been equipped with means for isolation and, at two pressurized water reactor (PWR) sites, robust fuel transfer tubes that enter the spent fuel pool directly. The liner normally prevents any loss of inventory through the leak detection lines, but isolation valves or plugs are available if the liner experiences a large leak or tear. The spent fuel pool and fuel storage area have instruments to alert operators to lower-than-normal cooling water levels, higher-than-normal cooling water temperature, and high radiation levels.

Spent Fuel Pool Cooling Systems

Each pool has an attached cooling system that transfers residual heat from radioactive decay in the stored fuel to the environment. These systems have adequate capacity to maintain spent fuel pool coolant temperature at levels that provide substantial time for recovery of cooling prior to reaching saturation conditions (i.e., bulk boiling) in the spent fuel pool. The NRC has ensured administrative controls on the transfer of fuel from the reactor to the spent fuel pool maintain this time for recovery of cooling or establishment of make-up water connections.

Make-up Water

All plants have systems available which can provide make-up water to the spent fuel pools to replace water lost due to evaporation or leakage. Most have at least one system which is designed to be available following a design basis earthquake. However, operating experience indicates that even non-seismically designed systems are likely to survive a design basis earthquake and be available for make-up to the spent fuel pools.

Furthermore, temporary systems are described in emergency and accident procedures to provide make-up water to the spent fuel pool if the normal make-up systems are unavailable. In some cases, these make-up water paths require installation of short piping segments between systems or connection of hoses. However, the fuel is unlikely to rapidly become uncovered because of the large inventory of spent fuel pool water, the robust design of the pool structure, and the limited paths for loss of water from the pool.

Emergency Cooling

In addition to the temporary make-up water systems, the nuclear power plant operators have established backup emergency cooling capability for the spent fuel pool in the unlikely event that a substantial loss of spent fuel pool coolant occurs that cannot be promptly recovered. As described above, the design of the spent fuel pool provides a high likelihood that events affecting the spent fuel pool would evolve slowly. To further slow the evolution of events involving a substantial loss of coolant, the configuration of spent fuel in the pool is carefully managed. The emergency cooling capability uses temporary equipment that would be available following fires, explosions, and other unlikely events that damage large portions of the facility and may prevent operation of normal cooling and make-up systems. The plant operators have been trained to use the emergency cooling equipment, and it has been evaluated to provide adequate cooling even if the pool structure loses its water-tight integrity. Thus, establishment of this emergency cooling capability within several hours would be adequate to protect the stored fuel from further degradation in a number of extreme scenarios.

Margin to Criticality

Under normal conditions, spent fuel pools have substantial margin to prevent criticality (i.e., a condition where fission would become self-sustaining) through the use of spacing between fuel assemblies and neutron-absorbing plates attached to the storage rack between each fuel assembly. Calculations demonstrate that some margin to criticality is maintained for a variety of abnormal conditions, including fuel handling accidents involving a dropped fuel assembly.

From: Shaffer, Mark R <ShafferMr@state.gov>
Sent: Sunday, March 27, 2011 3:25 AM
To: LIA03 Hoc
Subject: Fw: Site or unit 2 evac?

Question from Canada....any news from NRC on this??

From: Anthony.Hinton@international.gc.ca <Anthony.Hinton@international.gc.ca>
To: Shaffer, Mark R
Sent: Sun Mar 27 03:16:31 2011
Subject: Site or unit 2 evac?

Good morning Mark,

I'm on my way to the office but seeing CNN and others reporting evac of workers due to 100 R/hr fields at unit 2 turbine hall (?). Any truth to this as far as you know?

Thx,
Anthony

Anthony HINTON
Counsellor (Nuclear Affairs) | Conseiller (Affaires nucléaires)
Permanent Mission of Canada | Mission permanente du Canada
+43 664 812 3685

sent from my mobile device | envoyé de mon appareil mobile

0001 1162

From:	LIA07 Hoc
Sent:	Sunday, March 27, 2011 9:34 AM
To:	OST04 Hoc
Subject:	FW: Go Book Update - 0600 EDT March 27, 2011
Attachments:	NRC Status Update 3.27.11--0430 EDT.pdf; TEPCO Press Release 173.pdf; TEPCO Press Release 174.pdf; ET Chronology 3-27-11 0600.pdf; March 27 0600 EDT one pager.docx

From: LIA07 Hoc
Sent: Sunday, March 27, 2011 6:34 AM
To: Borchardt, Bill; Bradford, Anna; Cohen, Shari; Collins, Elmo; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Jaczko, Gregory; Johnson, Michael; Leeds, Eric; Loyd, Susan; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walls, Lorena; Weber, Michael
Cc: LIA07 Hoc
Subject: Go Book Update - 0600 EDT March 27, 2011

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

The updates include:

- The latest Status Update (0430 EDT, March 27, 2011)
- The latest "One Pager" (0600 EDT, March 27, 2011)
- The latest ET Chronology
- The latest TEPCO Press Releases (173 and 174)

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

-Jim

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

000163

From: OST01 HOC
Sent: Sunday, March 27, 2011 3:18 PM
To: ET07 Hoc; PMT02 Hoc; PMT11 Hoc; Hoc, PMT12
Cc: FOIA Response.hoc Resource
Subject: FW: OPs Support for Seismology Q&A

From: Kammerer, Annie
Sent: Sunday, March 27, 2011 3:15 PM
To: OST02 HOC; OST01 HOC; RST01 Hoc; Burnell, Scott; Harrington, Holly; Hogan, Rosemary; Karas, Rebecca
Subject: OPs Support for Seismology Q&A

Thanks for the concern. I am fine.

This change is an effort to get more helpers involved (by bringing Thomas in) and also a way to (rather directly) address the issue that everyone ignores the roster and just contacts me anyway (which has meant that I've essentially been on 24 hour call). Thomas Weaver is very smart, has a ton of seismic experience, and writes well. He is new to the agency, but will be running any "new" responses by Jon, Cliff or me and so there will still be consistency in the message and quality of the responses we are providing.

Shelby Bensi will also continue to compile the list of questions so that they are available for your use.

A key reason for the urgent transition now is that there a general awareness that as we rapidly move from emergency phase to the longer term response, some of the principal responsibilities of my "day job" (e.g.. coordinating the seismic and tsunami programs and assisting NRR with all the Diablo Canyon work) are probably going to explode very quickly....and my plate was already pretty full. So, my management really wants me to immediately focus on rapidly identifying existing and new areas of seismic research that we need to start or accelerate (and to work with rosemary to figure out what that means in terms of budget needs). Also, none of us are exactly sure what is going to happen with the 90 day team, and so we are prepping to be as helpful as possible.

Not surprisingly, it is expected that the NRC's seismic experts are going to have some long hours ahead. So, we're trying to figure out ways to continue to support OPA needs, while also starting to address the longer term challenges that this event has brought on in a thoughtful and meaningful way.

Cheers,
Annie

From: OST01 HOC
Sent: Friday, March 25, 2011 8:12 PM
To: OST02 HOC; OST01 HOC; RST01 Hoc; Burnell, Scott; Harrington, Holly; Hogan, Rosemary; Karas, Rebecca
Subject: OPs Support for Seismology Q&A

At this time, please contact the people in the attached file if you have any seismology questions. DO NOT CONTACT ANNIE KAMMERER. We will add the people on this list to the staffing roster to indicate when they should be contacted in the future.

Tony McMurtray

QQQ | 164

EST Coordinator

From: Stone, Rebecca
Sent: Monday, March 28, 2011 5:54 PM
To: Karas, Rebecca; Ralph, Melissa; Fiske, Jonathan
Subject: RE: Correction: FOIA information request

I have not heard anything but I have been out for the past couple of days.

John or Melissa - Have you had any more guidance?

From: Karas, Rebecca
Sent: Monday, March 28, 2011 1:26 PM
To: Stone, Rebecca; Ralph, Melissa; Fiske, Jonathan
Subject: FW: Correction: FOIA information request

Did final guidance on this ever come out (this is the last email I have). When is the due date for forwarding all emails?

Rebecca Karas, Chief
Geosciences and Geotechnical Engineering Branch 1
Division of Site and Environmental Reviews
Office of New Reactors
U.S. Nuclear Regulatory Commission
Phone: 301-415-7533
Fax: 301-415-5397

From: OST01 HOC
Sent: Saturday, March 19, 2011 3:25 PM
To: Abrams, Charlotte; Adams, John; Afshar-Tous, Mugeh; Alemu, Bezakulu; Alter, Peter; Anderson, James; Ashkeboussi, Nima; Baker, Stephen; Bergman, Thomas; Berry, Rollie; Bloom, Steven; Blount, Tom; Boger, Bruce; Bower, Anthony; Brandon, Lou; Brandt, Philip; Brock, Kathryn; Brown, Cris; Brown, David; Brown, Eva; Brown, Frederick; Bukharin, Oleg; Camper, Larry; Carpenter, Cynthia; Case, Michael; Casto, Greg; Cervera, Margaret; Chazell, Russell; Chen, Yen-Ju; Chokshi, Nilesh; Chowdhury, Prosanta; Circle, Jeff; Clement, Richard; Clinton, Rebecca; Collins, Frank; Cool, Donald; Costa, Arlon; Crutchley, Mary Glenn; Cruz, Zahira; Dacus, Eugene; DeCicco, Joseph; Decker, David; Dembek, Stephen; Devlin, Stephanie; Doane, Margaret; Dorman, Dan; Dozier, Jerry; Droggitis, Spiros; Dudek, Michael; Dudes, Laura; Emche, Danielle; English, Lance; Erlanger, Craig; Esmaili, Hossein; Figueroa, Roberto; Fiske, Jonathan; Franovich, Rani; Fuller, Edward; Galletta, Thomas; Gambone, Kimberly; Giitter, Joseph; Gordon, Dennis; Gott, William; Grant, Jeffery; Grobe, Jack; Hale, Jerry; Hardesty, Duane; Hart, Ken; Hart, Michelle; Hasselberg, Rick; Henderson, Karen; Hiland, Patrick; Holahan, Patricia; Holahan, Vincent; Holian, Brian; Huyck, Doug; Howard, Tabitha; Huffert, Anthony; Hurd, Sapna; Isom, James; Jackson, Karen; Jessie, Janelle; Johnson, Michael; Jolicoeur, John; Jones, Andrea; Jones, Cynthia; Kahler, Carolyn; Kammerer, Annie; Karas, Rebecca; Khan, Omar; Kowalczik, Jeffrey; Kozal, Jason; Kratchman, Jessica; Kugler, Andrew; Lamb, Christopher; Larson, Emily; LaVie, Steve; Lewis, Robert; Li, Yong; Lombard, Mark; Lubinski, John; Lynch, Jeffery; Mamish, Nader; Manahan, Michelle; Marksberry, Don; Marshall, Jane; Mayros, Lauren; Mazaika, Michael; McConnell, Keith; McCoppin, Michael; McDermott, Brian; McGinty, Tim; McMurtray, Anthony; Merritt, Christina; Meyer, Karen; Miller, Charles; Miller, Chris; Milligan, Patricia; Mohseni, Aby; Moore, Scott; Morlang, Gary; Morris, Scott; Mroz (Sahm), Sara; Munson, Clifford; Murray, Charles; Nerret, Amanda; Norris, Michael; Norton, Charles; Ordaz, Vonna; Padovan, Mark; Patel, Jay; Parillo, John; Pope, Tia; Purdy, Gary; Quinlan, Kevin; Ragland, Robert; Ralph, Melissa; Reed, Elizabeth; Reed, Wendy; Reis, Terrence; Riley (OCA), Timothy; Rini, Brett; Rodriguez-Luccioni, Hector; Rosenberg, Stacey; Ross-Lee, MaryJane; Roundtree, Amy; Ruland, William; Salay, Michael; Salus, Amy; Sanfilippo, Nathan; Scarbrough, Thomas; Schaperow, Jason; Schmidt, Duane; Schoenebeck, Greg; Schrader, Eric; Schwartzman, Jennifer; Seber, Dogan; Shane, Raeann; Shea, James; Shepherd, Jill; Sheron, Brian; Skeen, David; Sloan, Scott; Smiroldo, Elizabeth; Smith, Theodore; Stahl, Eric; Stang, Annette; Steger (Tucci), Christine; Stieve, Alice; Stone, Rebecca; Stransky,

QQQ | 165

Robert; Sturz, Fritz; Sullivan, Randy; Sun, Casper; Tappert, John; Temple, Jeffrey; Thaggard, Mark; Thomas, Eric; Thorp, John; Tobin, Jennifer; Trefethen, Jean; Tschiltz, Michael; Turtil, Richard; Uhle, Jennifer; Valencia, Sandra; Vaughn, James; Vick, Lawrence; Wastler, Sandra; Watson, Bruce; Weber, Michael; Webber, Robert; White, Bernard; Wiggins, Jim; Williams, Donna; Williams, Joseph; Williamson, Linda; Willis, Dori; Wimbush, Andrea; Wittick, Brian; Wray, John; Wright, Lisa (Gibney); Wright, Ned; Wunder, George; Young, Francis; Zimmerman, Roy
Subject: Correction: FOIA information request

Good Afternoon All,

The staff of the NRC HOC has received a broad scope FOIA request from the Associated Press requiring the release of all communications pertaining to the Japanese nuclear incidents caused by the March 11, 2011, earthquake and tsunami.

In response to this request, an email account is being created as a FOIA drop box. In the near future, you will be required to forward all emails that you have received (either to your personal email or HOC computer email) relating to these events to the established drop box. This includes emails that you have deleted but have the ability to restore. In addition, all future emails pertaining to the Japanese nuclear incidents MUST be copied to this drop box. The address is FOIA Response.hoc Resource@nrc.gov or FoiaResponse.hoc@nrc.gov.

A team is currently being assembled to ensure that all forwarded communications will be reviewed, and any information that qualifies for exemption (including P.I.I.) will be redacted. Therefore, you do not need to filter or redact any communication that is to be forwarded for compliance with this FOIA request.

This request has been granted expedited processing. It requires timely action from each of us to comply within the time constraints.

If you have any questions or concerns, please contact Rebecca Stone, Melissa Ralph, or Jonathan Fiske.

Search

Press Releases

Press Release (Mar 26,2011)
Status of TEPCO's Facilities and its services after Tohoku-Taiheiyou-Oki Earthquake (as of 4:00PM)

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

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

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

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

*Off-site power was connected to Unit 1 to 6.

*Unit 1
- The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36pm, March 12th.
- We started injection of sea water at 8:20 pm, March 12th, and then boric acid which absorbs neutron into the reactor afterwards.
- At approximately 2:30 am, March 23rd, we started the injection of sea water into the reactor from feed water system. After that, the injection of freshwater was started from 3:37 pm on March 25th (switched from the seawater injection).
- At approximately 10:50 am on March 24th, white smoke was confirmed arising from the top of the reactor building.
- At approximately 11:30 am, March 24th, lights in the main control room were restored.

*Unit 2
- At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in Clause 1, Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (failure of reactor cooling function). At 5:17 pm, March 14th, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation.
- At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there is a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.
  Sea water injection to the reactor continued.
- On March 18th, power was delivered up to substation for backup power through offsite transmission line. We completed laying cable further to unit receiving facility in the building, and at 3:46 pm, March 20th the load-side power panel of the receiving facility started to be energized.
- From 3: 05 pm to 5: 20 pm on March 20th, 40 tons of seawater was injected into Unit 2 by TEPCO employees.
- At 6:20 on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level where we could hardly confirm.
- From around 4 pm to 5 pm on March 22nd, approximately 18 tons of sea water was injected into the spent fuel pool by TEPCO employees.
- From 10:30 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated. The work finished at 0:19 pm

0001/166

on March 25th.
- From 10:10 am on March 26th, freshwater (with boric acid) injection was initiated. (switched from the seawater injection)

*Unit 3
- At 6:50 am, March 14th, while water injection to the reactor was under operation, the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in article 15, clause 1 occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure gradually decreased (as of 9:05 am, 490 kPa).
- At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them were conscious) sustained injuries and were taken to the hospital by ambulances.
- As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered. However the operation on March 16th was cancelled.
- At 6:15 am, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable within a certain range. On March 20th, we were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
- In order to cool spent fuel pool, water was sprayed by helicopters on March 17th with the cooperation of Self-Defense Forces.
- At approximately past 7:00 pm, March 17th, Self-Defense Forces and the police started spraying water by water cannon trucks upon our request for the cooperation. At 8:09 pm, March 17th, they finished the operation.
- At 2:00 pm, March 18th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At 2:45 pm, March 18th, the operation was finished.
- At approximately 0:30 am, March 19th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 1:10 am, March 19th, the operation was finished. They resumed spraying water at 2:10 pm and finished at approximately 3:40 am, March 20th.
- At approximately 9:30 pm, March 20th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 3:58 am, March 21th, they the operation was finished.
- At approximately 3:55 pm, March 21st, light gray smoke was confirmed arising from the southeast side of the 5th floor roof of the Unit 3 building. The situation was reported to the fire department at approximately 4:21 pm. The parameters of reactor pressure vessel, reactor containment vessel, and monitored environmental data remained stable without significant change. However, employees working around Unit 3 evacuated to a safe location. On March 22nd, the color of smoke changed to somewhat white and it is slowly dissipating.
- At approximately 3:10 pm on March 22nd, spraying water to Unit 3 by Tokyo Fire Department's Hyper Rescue and Osaka City Fire Department was conducted, and completed at approximately 4:00 PM on the same day.
- At approximately 10:45 pm on March 22nd, lights in the main operation room were restored.
- At 11:00 am on March 23rd, the injection of sea water to spent fuel pool was conducted, and finished approximately at 1:20 pm on the same day.
- At 4:20 pm on March 23rd, light gray smoke was observed belching from Unit 3 building. The situation was reported to the fire department at 4:25 pm on March 23rd. The parameters of the reactor, the reactor containment vessel of Unit 3, and monitored figures around the site's immediate surroundings remained stable without significant change. To be safe, workers in the main control room of Unit 3 and around Unit 3 evacuated to a safe location.At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, TEPCO employees confirmed the smoke has disappeared. Accordingly, workers evacuation was lifted.
- From approximately 5:35 am on March 24th, sea water injection through Fuel Pool Cooling and Filtering System was initiated, and finished at approximately 4:05 pm on the same day.
- From 1:28 pm on March 25th, Hyper Rescue team started water spray. The work finished at 4:00 pm on March 25th.
- From 6:02 pm on March 25th, the injection of freshwater to the reactor was started (switched from the seawater injection).

*Unit 4
- At approximately 6:00 am, March 15th, an explosive sound was heard and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employees confirmed that the fire was out.
- At approximately 5:45 am on March 16th, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approximately 6:15 am, TEPCO staff confirmed at the site that there are no signs of fire.

- At approximately 8:21 am on March 20th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and they finished the operation at approximately 9:40 am. At approximately 6:45 pm spraying water was started by Self-Defenses' water cannon trucks and finished at approximately 7:45 pm.
- At approximately 6:30 am, March 21st, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At approximately 8:40 am, March 21, they had finished the operation.
- On March 21st, cabling has been completed from temporary substation to the main power center.
- From approximately 5:20 pm on March 22nd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 8:30 pm on the same day.
- From approximately 10:00 am on March 23rd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 1:00 pm on the same day.
- From approximately 2:35 pm on March 24th, spraying water by the concrete pumping vehicle was conducted and ended at approximately 5:30 pm on the same day.
- From 6:05 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated and finished at approximately 10:20 am on the same day.
- From 7:05 pm on March 25th, water spray by the concrete pumping vehicle was started and finished at 10:07 pm on March 25th.

*Unit 5 and 6
- At 5 am on March 19th, we started the Residual Heat Removal System Pump (C) of Unit 5 in order to cool the spent fuel pool. At 10:14 pm, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
- Unit 5 has been in reactor cold shutdown since 2:30 pm on March 20th. Unit 6 has been in reactor cold shutdown since 7:27 pm on March 20th.
- At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
- At approximately 5:24 pm on March 23rd, the temporary Residual Heat Removal System Seawater Pump automatically stopped when its power source was switched. We restarted the pump at around 4:14 pm, March 24th, and resumed cooling of reactor at around 4:35 pm.

*On March 18th, regarding the spent fuel in the common spent fuel pool, we have confirmed that the water level of the pool is secured. At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
*common spent fuel pool: a spent fuel pool for common use set in a separate building in a plant site in order to preserve spent fuel which are transferred from the spent fuel pool in each Unit building.

*On March 17th, we patrolled buildings for dry casks and found no signs of abnormal situation for the casks by visual observation. A detailed inspection is under preparation.
*dry cask: a measure to store spent fuel in a dry storage casks in storages. Fukushima Daiichi Nuclear Power Station started to utilize the measure from August 1995.

* In total 13 fire engines are lent for spraying water to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments* as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided.

* On March 24, 2011, it was confirmed that 3 workers from cooperative companies who were in charge of cable laying work in the 1st floor and the underground floor of turbine building were exposed to the radiation dose of more than 170mSv. 2 of them were confirmed that their leg skins were contaminated. Although they were decontaminated by laundering, they were transferred to Fukushima Medical University hospital because there is possibility that they get a burn injury by beta ray. On March 25th, remaining worker was also transferred to Fukushima Medical University hospital. After that, all 3 workers arrived at National Institute of Radiological Sciences in Chiba Prefecture. We will assess radiation dose of 2 worker's skin on their legs by beta ray. We thoroughly instruct our employees and workers of cooperative companies to recognize APD alarm and evacuate when the alarm rings. We will explain this event, together with appropriate measures to be taken, to the government and to people concerned in order to fully secure the safety in relation to radiation dose management and operations associated with radiation exposure.

* On March 21st, 23rd to 25th, we detected technetium, cobalt, iodine, cesium, tellurium, barium, lanthanum and molybdenum from the seawater around discharge canal of Unit 1, 2, 3 and 4.

* On March 20th, 21st, 23rd to 25th, we detected iodine, cesium, tellurium and ruthenium in the air collected at the site of Fukushima Daiichi Nuclear Power Station.

*We will continuously endeavor to securing safety, and monitoring of the surrounding environment.

Fukushima Daini Nuclear Power Station:
Units 1 to 4: shutdown due to earthquake
* The national government has instructed evacuation for those local residents within 10km radius of the periphery.

* In order to achieve cold shutdown, reactor cooling function was restored and cooling of reactors was conducted. As a result, all reactors achieved cold shutdown: Unit 1 at 5:00 pm, March 14th, Unit 2 at 6:00 pm, March 14th, Unit 3 at 0:15 pm, March 12th, Unit 4 at 7:15 am, March 16th.

* Since March 12th, we had been preparing measures for reducing the pressure of reactor containment vessels (partial discharge of air containing radioactive materials to outside), but on March 17th, we stopped such preparation in all Units.

* (Unit 1)
As it is confirmed that the temperature of the Emergency Equipment Cooling Water System *1 has increased, at 3:20 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 4:25 pm, March 15th, after replacing the power facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

* (Unit 4)
As it is confirmed that the pressure at the outlet of the pumps of the Emergency Equipment Cooling Water System*1 has been decreased, at 8:05 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 9:25 pm, March 15th, after replacing the relevant facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

*1:emergency water system in which cooling water (pure water) circulates which exchanged the heat with sea water in order to cool down bearing pumps and/or heat exchangers etc.

Kashiwazaki Kariwa Nuclear Power Station:
Units 1, 5, 6, 7: normal operation
(Units 2 to 4: outage due to regular inspection)

[Thermal Power Station]
- Hirono Thermal Power Station Units 2 and 4: shutdown due to earthquake
- Hitachinaka Thermal Power Station Unit 1: shutdown due to earthquake
- Kashima Thermal Power Station Units 2, 3, 5, 6: shutdown due to earthquake

[Hydro Power Station]
- All the stations have been restored.
(Facilities damaged by the earthquake are now being repaired in a timely manner.)

[Transmission System, etc.]
- All substation failed due to the earthquake have been restored.
(Facilities damaged by the earthquake are now being repaired in a timely manner.)

[Blackout in TEPCO's Service Area]
- All the blackouts are resolved.

[Supply and Demand Status within TEPCO's Service Area to Secure Stable Power Supply]
- Considering the critical balance of our power supply capacity and expected power demand forward, in order to avoid unexpected blackout, TEPCO has been implementing rolling blackout (planned blackout alternates from one area to another) since Mar 14th. We will make our utmost to secure the stable power supply as early as possible. For customers who will be subject to rolling blackout, please be prepared for the announced blackout periods. Also for customers who are not subject to blackouts, TEPCO appreciates your continuous cooperation in reducing electricity usage by avoiding using unnecessary lighting and electrical equipment.

[Others]
- Please do NOT touch cut-off electric wires.
- In order to prevent fire, please make sure to switch off the electric appliances such as hair driers when you leave your house.
- For the customer who has in-house power generation, please secure fuel for generator.

Back to page top

Search

Press Releases

Press Release (Mar 26,2011)
Plant Status of Fukushima Daiichi Nuclear Power Station (as of 8:00 PM Mar 26th)

Plant Status of Fukushima Daiichi Nuclear Power Station (as of 8:00 PM Mar 26th)

*new items are underlined

All 6 units of Fukushima Daiichi Nuclear Power Station have been shut down.

Unit 1(Shut down)
-Explosive sound and white smoke were confirmed after the big quake occurred at 3:36 pm Mar 12th. It was assumed to be hydrogen explosion.
-At approximately 2:30 am on March 23rd, seawater was started to be injected to the nuclear reactor through the feed water system.
-At approximately 10:50 am on March 24th, white fog-like steam arising from the roof part of the reactor building was observed.
-At approximately 11:30 am on March 24th, lights in the main control room was restored.
-We had been injecting sea water into the reactor, but from 3:37 pm on March 25th, we started injecting fresh water into it.

Unit 2(Shut down)
-At approximately 6:00 am on March 15th, an abnormal noise began emanating from nearby Pressure Suppression Chamber and the pressure within this chamber decreased.
-At 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level to nearly non-existent.
-We have been injecting sea water into the reactor, but from 10:10 am on March 26th, we started injecting fresh water (with boric acid) into it.
-At approximately 4:46 pm on March 26nd, the light in the main control room was turned on.

Unit 3(Shut down)
-Explosive sound and white smoke were confirmed at 11:01am March 4th. It was assumed to be hydrogen explosion.
-At 8:30am on March 16th, fog like steam was confirmed arising from the reactor building.
-At approximately 6:15 am on March 17th the pressure of the Suppression Chamber has temporarily increased. We were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
-At approximately 4:00 pm, March 21st, light gray smoke was confirmed arising from the floor roof of the Unit 3 building. On March 22nd, the color of smoke changed to somewhat white and it is slowly dissipating.
-At approximately 10:45 pm on March 22nd, the light in the main control room was turned on.
-At around 4:20 pm on March 23rd, our staff confirmed light black smoke belching from the Unit 3 building. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, our employee found no signs of smoke.
-We had been injecting sea water into the reactor pressure vessel, but from 6:02 pm on March 25th, we started injecting fresh water into it.

Unit 4 (outage due to regular inspection)
-At approximately 6 am on March 15th, we confirmed the explosive sound and the sustained damage around the 5th floor rooftop area of the Nuclear Reactor Building.
-On March 15th and 16th, we respectively confirmed the outbreak of fire at the 4th floor of the northwestern part of the Nuclear Reactor Building. We immediately reported this matter to the fire department and the related authorities. TEPCO employees confirmed that each fire had already died down by itself.

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-At this moment, we do not consider any reactor coolant leakage inside the reactor happened.

Unit 5 (outage due to regular inspection)
-Sufficient level of reactor coolant to ensure safety is maintained.
-At 5 am, March 19th, we started the Residual Heat Removal System Pump (C) in order to cool the spent fuel pool.
-At 2:30 pm, March 20th, the reactor achieved reactor cold shutdown.
At around 5:24 pm on March 23rd, when we switched the temporary Residual Heat Removal System Seawater Pump, it has stopped automatically.
At around 4:14 pm, March 24th we replaced the pump, and restarted cooling of reactor at around 4:35 pm.
-At this moment, we do not consider any reactor coolant leakage inside the reactor containment vessel happened.

Unit 6 (outage due to regular inspection)
-Sufficient level of reactor coolant to ensure safety is maintained.
-We completed the repair work on the emergency diesel generator (A).
-At 10:14 pm, March 19th, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
-At 7:27 pm, March 20th, the reactor achieved reactor cold shutdown.
-In relation to the two seawater side pumps of the Residual Heat Removal System, we switched the power source from temporary to permanent at 3:38 PM and 3:42PM, Mar 25 respectively.
-At this moment, we do not consider any reactor coolant leakage inside the reactor containment vessel happened.

Today's work for cooling the spent fuel pools
-We are considering further spraying subject to the conditions of spent fuel pools.

Casualty
-2 workers of cooperative firm were injured at the occurrence of the earthquake, and were transported to the hospital on March 11th.
-Presence of 2 TEPCO employees at the site is not confirmed on March 11th.
-1 TEPCO employee who was not able to stand by his own holding left chest with his hand, was transported to the hospital by an ambulance on March 12th.
-4 workers were injured and transported to the hospital after explosive sound and white smoke were confirmed around the Unit 1on March 12th.
-1 subcontract worker at the key earthquake-proof building was unconscious and transported to the hospital by an ambulance on March 12th.
-The radiation exposure of 1 TEPCO employee, who was working inside the reactor building, exceeded 100mSv and he was transported to the hospital on March 12th.
-2 TEPCO employees felt bad during their operation in the central control rooms of Unit 1 and 2 while wearing full masks, and were transferred to Fukushima Daini Nuclear Power Station for consultation with a medical advisor on March 13th.
-11 workers were injured and transported to Fukushima Daini Nuclear Power Station etc. after explosive sound and white smoke were confirmed around the Unit 3. One of the workers was transported to the Fukushima Medical University Hospital on March 14th.
-At approximately 10 pm on March 22nd, 1 worker who had been working on setting up a temporary power panel in the common pool was injured and transported to Fukushima Daini Nuclear Power Station where the industrial doctor is.
-At approximately 1:30 am on March 23rd, 1 worker who had been working on transporting a temporary power panel in the common pool was injured and transported to Fukushima Daini Nuclear Power Station where the industrial doctor is.
-On March 24th, it was confirmed that 3 workers from cooperative companies who were in charge of cable laying work in the 1st floor and the underground floor of turbine building were exposed to the radiation dose of more than 170 mSv. 2 of them were confirmed that their skins on legs were contaminated. Although they were decontaminated, since there was a possibility of beta ray burn injury, they were transferred to Fukushima Medical University Hospital. The third worker was also transferred to Fukushima Medical University Hospital on March 25th.
After that, the 3 workers were transferred to National Institute of Radiological Sciences in Chiba Prefecture.
Regarding this event, TEPCO has reported to the related government ministries and agencies on measures to be taken to assure appropriate radiation dose control and radiation exposure related operations.
Before today's restoration work, we will make notification to the concerned parties and continue to take all possible measures to future management.

Others
-We measured radioactive materials (iodine etc.) inside of the nuclear power station area (outdoor) by monitoring car and confirmed that radioactive materials level is getting higher than ordinary level.
As listed below, we have determined that specific incidents stipulated in article 15, clause 1 of Act on Special Measures Concerning Nuclear Emergency Preparedness (Abnormal increase in radiation dose measured at site boundary) have occurred.

- Determined at 4:17 pm Mar 12th (Around Monitoring Post 4)
- Determined at 8:56 am Mar 13th (Around Monitoring Post 4)
- Determined at 2:15 pm Mar 13th (Around Monitoring Post 4)
- Determined at 3:50 am Mar 14th (Around Monitoring Post 6)
- Determined at 4:15 am Mar 14th (Around Monitoring Post 2)
- Determined at 9:27 am Mar 14th (Around Monitoring Post 3)
- Determined at 9:37 pm Mar 14th (Around main entrance)
- Determined at 6:51 am Mar 15th (Around main entrance)
- Determined at 8:11 am Mar 15th (Around main entrance)
- Determined at 4:17 pm Mar 15th (Around main entrance)
- Determined at 11:05 pm Mar 15th (Around main entrance)
- Determined at 8:58 am Mar 19th (Around MP5)

From now on, if the measured figure fluctuates and goes above and below 500 micro Sv/h, we deem that as the continuous same event and will not regard that as a new specific incidents stipulated in article 15, clause 1 of the Act on Special Measures Concerning Nuclear Emergency Preparedness (Abnormal increase in radiation dose measured at site boundary) has occurred. In the interim, if we measure a manifestly abnormal figure and
it is evident that the event is not the continuous same event, we will determine and notify.

-The national government has instructed evacuation for those local residents within 20km radius of the periphery and evacuation to inside for those residents from 20km to 30km radius of the periphery, because it is possible that radioactive materials are discharged.
-At approximately 10am on March 15th, we observed 400mSv/h at the inland side of the Unit 3 reactor building and 100mSv/h at the inland side of the Unit 4 reactor building.
-At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm (conducted by TEPCO).
-At around 3:37 pm, March 24th, electricity supply to common spent fuel pool has started from external power source. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
We found no signs of abnormal situation for the casks by visual observation during the patrol activity. A detailed inspection is under preparation.
-At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
-In total 12 fire engines are lent for the water spraying to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments* as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided by Niigata City Fire Headquarter and Hamamatsu City Fire Headquarter.
*: Koriyama Fire Department, Iwaki Fire Brigade Headquarters, Fire Headquarters of Sukagawa District Wide Area Fire-fighting Association, Yonezawa City Fire Headquarters, Utsunomiya City Fire Headquarters, Fire Headquarters of Aizu-Wakamatsu wide area municipal association, Saitama City Fire Bureau, and Niigata City Fire Bureau.
-By March 22nd, Units 1 through 6 were started to be energized from the external power source.
-We will continue to take all measures to ensure the safety and to continue monitoring the surrounding environment around the Power Station.

back to page top

From: LIA02 Hoc
Sent: Monday, March 28, 2011 1:35 PM
To: Owen, Lucy
Cc: LIA03 Hoc
Subject: FW: Blackberry for Japan

Lucy,

I was advised to forward emails for Elmo also to you so that you can ensure that he gets them.

An update to the message below from OIS: Elmo should get intermittent service on his Verizon bb. We have also sent a message to the team already in Japan to ask them to arrange for a bb to be held there for Elmo to use.

Let us know if you have any questions.

Cheers,

Karen (LIA02) and Jill (LIA03)

From: LIA02 Hoc
Sent: Monday, March 28, 2011 10:39 AM
To: Collins, Elmo
Cc: LIA03 Hoc; ET02 Hoc
Subject: Blackberry for Japan

Elmo,

OIS has informed us that your Verizon blackberry will not work in Japan. You will need either to get an AT&T-enabled blackberry, or we can ask one of the team members who is leaving Japan to leave their blackberry behind for you to pick up on arrival. Which path would you prefer?

Cheers,

Karen Henderson (LIA02)

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News Release

経済産業省
Ministry of Economy, Trade and Industry

March 28, 2011
Nuclear and Industrial Safety Agency

Regarding the result of concentration measurement in the stagnant water on the basement floor of the turbine building of Unit 2 of Fukushima Dai-ichi Nuclear Power Station

1. Regarding the captioned result of the measurement announced by TEPCO yesterday, TEPCO reported to NISA the result of analysis and evaluation through re-sampling, judging the measured value of ionide-134 was wrong. The outline is attached.

2. Since it was a mistake in the evaluation regarding the concentration measurement of important radioactive materials, NISA directed TEPCO orally to prevent the recurrence of such a mistake.

Appendix: The results of measurement of puddle of water in the basement of the turbine building of Unit 2 of Fukushima Daiichi Nuclear Power Station
http://www.tepco.co.jp/en/press/corp-com/release/betu11_e/images/110327e15.pdf

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

QQQ | 169

Fukushima Dai-ni NPS

as of 17:30, March 27th, 2011

MP1 : 9.777μSv/h
(Ref. Value:0.035～0.054μSv/h)

Location of Monitoring Post

MP2 : 5.560μSv/h
(Ref. Value:0.042～0.062μSv/h)

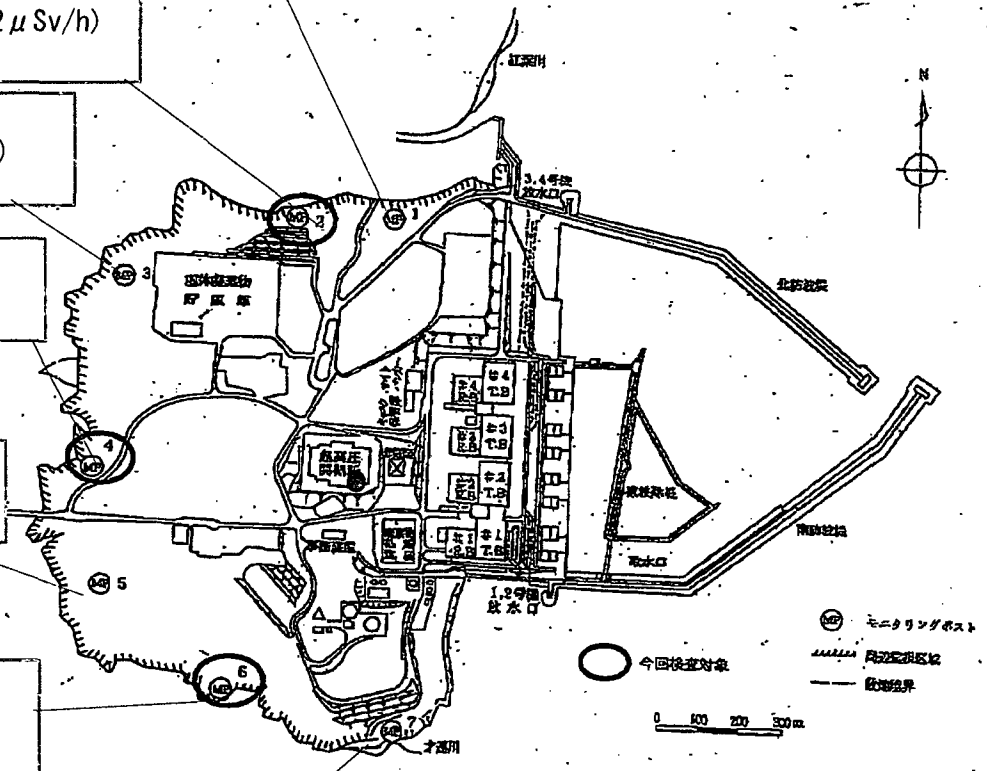
MP3 : 9.267μSv/h
(Ref. Valur:0.036～0.052μSv/h)

MP4 : 7.067μv/h
(Ref. value: 0.036～0.052μSv/h)

MP5 : 6.467μSv/h
(Ref. Value:0.041～0.058μSv/h)

MP6 : 7.657μSv/h
(Ref. value:0.044～0.063μSv/h)

MP7 : N.D
(Ref. Value: 0.043～0.062μSv/h)



別紙資料（2）

Fukushima Dai-ni (TEPCO's Monitaring Post)

March 27th, 2011																								
monitoring point	12:00	12:10	12:20	12:30	12:40	12:50	13:00	13:10	13:20	13:30	13:40	13:50	14:00	14:10	14:20	14:30	14:40	14:50	15:00	15:10	15:20	15:30	15:40	15:50
MP1(μSv/h)	9.903	9.910	9.947	9.937	9.907	9.887	9.890	9.870	9.863	9.817	9.857	9.850	9.833	9.833	9.830	9.777								
MP2(μSv/h)	5.650	5.613	5.643	5.620	5.653	5.627	5.603	5.620	5.617	5.617	5.597	5.583	5.583	5.593	5.563	5.560								
MP3(μSv/h)	9.313	9.367	9.333	9.333	9.293	9.323	9.267	9.310	9.283	9.277	9.263	9.280	9.277	9.247	9.250	9.267								
MP4(μSv/h)	7.107	7.110	7.113	7.110	7.113	7.107	7.090	7.127	7.110	7.080	7.067	7.053	7.047	7.063	7.043	7.067								
MP5(μSv/h)	6.467	6.467	6.473	6.540	6.467	6.467	6.473	6.467	6.467	6.473	6.473	6.467	6.467	6.467	6.467	6.467								
MP6(μSv/h)	7.747	7.743	7.720	7.717	7.703	7.703	7.740	7.670	7.667	7.680	7.700	7.693	7.683	7.677	7.680	7.657								
MP7(μSv/h)	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D								
wind direction	WNW	W	NW	W	W	NW	NW	WNW	NW	WNW	NW	WNW	NW	NW	NNW	NNW								
wind speed (m/s)	5.8	4.8	3.3	3.6	5.9	5.2	3.6	4.6	4.7	5.8	6.9	6.6	6.5	6.5	8.1	6.6								

March 27th, 2011																								
monitoring point	16:00	16:10	16:20	16:30	16:40	16:50	17:00	17:10	17:20	17:30	17:40	17:50	18:00	18:10	18:20	18:30	18:40	18:50	19:00	19:10	19:20	19:30	19:40	19:50
MP1(μSv/h)																								
MP2(μSv/h)																								
MP3(μSv/h)																								
MP4(μSv/h)																								
MP5(μSv/h)																								
MP6(μSv/h)																								
MP7(μSv/h)																								
wind direction																								
wind speed (m/s)																								

March 27th, 2011																								
monitoring point	20:00	20:10	20:20	20:30	20:40	20:50	21:00	21:10	21:20	21:30	21:40	21:50	22:00	22:10	22:20	22:30	22:40	22:50	23:00	23:10	23:20	23:30	23:40	23:50
MP1(μSv/h)																								
MP2(μSv/h)																								
MP3(μSv/h)																								
MP4(μSv/h)																								
MP5(μSv/h)																								
MP6(μSv/h)																								
MP7(μSv/h)																								
wind direction																								
wind speed (m/s)																								

Fukushima Dai-ni (TEPCO's Monitaring Post)

March 27th, 2011																								
monitoring point	00:00	00:10	00:20	00:30	00:40	00:50	01:00	01:10	01:20	01:30	01:40	01:50	02:00	02:10	02:20	02:30	02:40	02:50	03:00	03:10	03:20	03:30	03:40	03:50
MP1(μSv/h)	10.283	10.270	10.257	10.270	10.270	10.273	10.213	10.233	10.267	10.257	10.197	10.240	10.223	10.207	10.183	10.210	10.200	10.190	10.167	10.163	10.173	10.187	10.153	10.127
MP2(μSv/h)	5.863	5.870	5.877	5.870	5.857	5.853	5.870	5.837	5.863	5.850	5.837	5.863	5.830	5.807	5.817	5.833	5.807	5.797	5.833	5.817	5.783	5.823	5.787	5.780
MP3(μSv/h)	9.780	9.783	9.780	9.743	9.730	9.740	9.753	9.690	9.730	9.713	9.737	9.753	9.650	9.727	9.690	9.680	9.687	9.643	9.657	9.677	9.643	9.657	9.633	9.640
MP4(μSv/h)	7.500	7.467	7.487	7.493	7.450	7.457	7.467	7.467	7.437	7.443	7.440	7.423	7.433	7.440	7.440	7.413	7.403	7.380	7.397	7.423	7.397	7.363	7.363	7.370
MP5(μSv/h)	6.867	6.867	6.867	6.867	6.867	6.867	6.867	6.867	6.867	6.847	6.860	6.767	6.813	6.787	6.767	6.820	6.767	6.767	6.813	6.767	6.767	6.767	6.767	6.767
MP6(μSv/h)	8.083	8.077	8.063	8.080	8.037	8.037	8.027	8.023	8.030	8.030	8.027	8.007	7.980	7.993	7.983	8.003	7.990	7.987	7.983	7.957	7.943	7.970	7.927	7.987
MP7(μSv/h)	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
wind direction	NW	NW	WNW	WNW	WNW	NW	WNW	NW	WNW	WNW	NW	NW	NW	WNW	WNW	NW	WNW	NW	NW	NW	WNW	NW	NW	NNW
wind speed (m/s)	7.8	6.7	7.7	6.6	6.9	5.6	5.2	5.0	4.6	7.0	6.8	6.2	6.9	7.1	4.7	4.5	5.2	6.0	6.0	5.3	5.7	6.6	7.7	5.6

March 27th, 2011																								
monitoring point	04:00	04:10	04:20	04:30	04:40	04:50	05:00	05:10	05:20	05:30	05:40	05:50	06:00	06:10	06:20	06:30	06:40	06:50	07:00	07:10	07:20	07:30	07:40	07:50
MP1(μSv/h)	10.133	10.133	10.127	10.113	10.097	10.137	10.117	10.093	10.040	10.087	10.083	10.070	10.073	10.080	10.073	10.073	10.007	10.013	10.027	10.027	10.033	9.993	9.993	9.983
MP2(μSv/h)	5.803	5.780	5.780	5.777	5.783	5.753	5.777	5.773	5.727	5.753	5.730	5.747	5.740	5.733	5.750	5.737	5.710	5.723	5.723	5.707	5.683	5.707	5.683	5.723
MP3(μSv/h)	9.637	9.687	9.613	9.570	9.533	9.547	9.587	9.563	9.533	9.520	9.550	9.563	9.570	9.500	9.510	9.547	9.543	9.527	9.473	9.483	9.493	9.483	9.463	9.453
MP4(μSv/h)	7.357	7.363	7.363	7.377	7.350	7.353	7.333	7.327	7.320	7.347	7.327	7.320	7.320	7.283	7.300	7.277	7.297	7.290	7.273	7.257	7.263	7.227	7.267	7.230
MP5(μSv/h)	6.773	6.767	6.767	6.767	6.713	6.747	6.720	6.767	6.667	6.700	6.713	6.740	6.667	6.673	6.673	6.667	6.667	6.673	6.667	6.673	6.667	6.673	6.673	6.667
MP6(μSv/h)	7.957	7.927	7.967	7.933	7.917	7.953	7.907	7.937	7.910	7.917	7.903	7.913	7.903	7.900	7.877	7.890	7.860	7.890	7.870	7.867	7.867	7.857	7.893	7.843
MP7(μSv/h)	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
wind direction	NW	NNW	NW	NW	NW	WNW	NW	NW	NW	NW	WNW	WNW	WNW	WNW	W	WNW	WNW	WNW	WNW	W	WNW	WNW	WNW	NW
wind speed (m/s)	5.4	5.7	4.8	5.5	5.0	5.0	4.4	5.0	4.6	4.9	5.8	7.7	6.9	7.9	8.5	7.4	7.5	5.3	5.3	7.3	7.3	5.5	4.6	5.3

March 27th, 2011																								
monitoring point	08:00	08:10	08:20	08:30	08:40	08:50	09:00	09:10	09:20	09:30	09:40	09:50	10:00	10:10	10:20	10:30	10:40	10:50	11:00	11:10	11:20	11:30	11:40	11:50
MP1(μSv/h)	9.970	9.993	9.983	9.960	9.943	9.953	9.937	9.940	9.983	9.920	9.893	9.923	9.920	9.943	9.940	9.920	9.890	9.907	9.913	9.970	10.327	9.997	9.990	9.940
MP2(μSv/h)	5.700	5.697	5.680	5.680	5.687	5.687	5.700	5.643	5.687	5.650	5.637	5.677	5.687	5.640	5.643	5.650	5.670	5.647	5.673	5.643	5.913	5.680	5.670	5.660
MP3(μSv/h)	9.440	9.440	9.453	9.470	9.440	9.467	9.413	9.410	9.433	9.407	9.420	9.410	9.407	9.367	9.397	9.363	9.390	9.360	9.360	9.397	9.360	6.363	9.327	9.313
MP4(μSv/h)	7.270	7.207	7.260	7.200	7.203	7.240	7.223	7.187	7.183	7.177	7.210	7.223	7.180	7.180	7.227	7.173	7.157	7.180	7.153	7.157	7.140	7.137	7.110	7.120
MP5(μSv/h)	6.627	6.640	6.667	6.660	6.673	6.567	6.627	6.567	6.567	6.607	6.567	6.567	6.567	6.567	6.567	6.567	6.567	6.567	6.520	6.567	6.567	6.553	6.520	6.513
MP6(μSv/h)	7.813	7.833	7.823	7.820	7.820	7.790	7.810	7.817	7.800	7.807	7.817	7.833	7.790	7.770	7.770	7.790	7.767	7.737	7.770	7.780	7.753	7.753	7.737	7.703
MP7(μSv/h)	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
wind direction	NW	NNW	NNW	NNW	NW	N	NNW	NNE	NE	NNE	NNE	NE	NE	NE	NNE	N	NNW	N	NW	WNW	WNW	WNW	WNW	WNW
wind speed (m/s)	4.8	3.6	4.7	3.0	2.1	3.9	4.0	1.6	3.3	2.4	2.8	2.2	3.0	1.7	2.8	3.1	3.9	3.0	3.6	2.5	3.0	2.8	3.3	2.1

Fukushima Dai-ni (TEPCO's Monitaring Post)

March 26th, 2011																								
monitoring point	12:00	12:10	12:20	12:30	12:40	12:50	13:00	13:10	13:20	13:30	13:40	13:50	14:00	14:10	14:20	14:30	14:40	14:50	15:00	15:10	15:20	15:30	15:40	15:50
MP1(μSv/h)	10.817	10.807	10.767	10.743	10.757	10.747	10.717	10.743	10.710	10.713	10.727	10.727	10.683	10.660	10.677	10.677	10.667	10.687	10.663	10.673	10.640	10.607	10.610	10.653
MP2(μSv/h)	6.127	6.153	6.123	6.123	6.123	6.137	6.117	6.113	6.113	6.140	6.130	6.100	6.090	6.107	6.087	6.123	6.097	6.123	6.087	6.097	6.090	6.073	6.077	6.087
MP3(μSv/h)	10.157	10.200	10.173	10.170	10.190	10.170	10.187	10.147	10.123	10.170	10.130	10.153	10.110	10.117	10.123	10.080	10.113	10.093	10.103	10.140	10.077	10.073	10.083	10.030
MP4(μSv/h)	7.807	7.827	7.823	7.833	7.810	7.813	7.817	7.803	7.817	7.783	7.757	7.813	7.770	7.743	7.780	7.753	7.763	7.733	7.750	7.753	7.727	7.733	7.747	7.683
MP5(μSv/h)	7.160	7.153	7.153	7.153	7.153	7.160	7.153	7.153	7.160	7.160	7.153	7.113	7.100	7.133	7.107	7.113	7.107	7.160	7.160	7.080	7.153	7.113	7.160	7.053
MP6(μSv/h)	8.357	8.387	8.353	8.333	8.330	8.350	8.353	8.367	8.357	8.370	8.347	8.343	8.323	8.323	8.347	8.293	8.323	8.310	8.337	8.313	8.327	8.327	8.303	8.317
MP7(μSv/h)	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	4.650	N.D	N.D	N.D	N.D	N.D
wind direction	NNW	NW	NNW	NNW	NNW	NW	NW	NW	NNW	NW	NW	NW	NW	NW	NW	NNW	NW	NW	NW	NW	NW	NW	NW	WNW
wind speed (m/s)	13.8	11.1	11.2	13.7	11.6	11.7	11.0	10.5	12.0	9.9	9.4	9.5	11.2	10.2	6.6	6.9	6.7	6.8	3.8	5.1	6.2	4.5	5.5	4.4

March 26th, 2011																								
monitoring point	16:00	16:10	16:20	16:30	16:40	16:50	17:00	17:10	17:20	17:30	17:40	17:50	18:00	18:10	18:20	18:30	18:40	18:50	19:00	19:10	19:20	19:30	19:40	19:50
MP1(μSv/h)	10.587	10.637	10.600	10.590	10.543	10.583	10.590	10.570	10.557	10.553	10.543	10.500	10.537	10.573	10.520	10.520	10.510	10.473	10.487	10.500	10.427	10.503	10.457	10.460
MP2(μSv/h)	6.060	6.073	6.067	6.070	6.030	6.080	6.063	6.057	6.053	6.007	6.020	6.017	6.020	6.023	6.017	5.983	6.013	5.997	6.030	5.967	6.010	6.000	5.970	5.973
MP3(μSv/h)	10.070	10.043	10.070	10.063	10.003	10.017	10.007	10.047	10.003	10.037	10.010	10.007	10.000	9.937	9.980	9.977	9.957	9.977	9.973	9.970	9.957	9.930	9.937	9.913
MP4(μSv/h)	7.717	7.723	7.723	7.700	7.700	7.690	7.697	7.703	7.707	7.690	7.690	7.657	7.643	7.663	7.667	7.663	7.627	7.643	7.623	7.623	7.637	7.623	7.610	7.593
MP5(μSv/h)	7.053	7.060	7.053	7.053	7.053	7.053	7.060	7.060	7.053	7.060	7.060	7.060	7.060	7.060	7.060	7.053	7.060	7.060	7.013	7.007	7.060	7.027	6.967	6.960
MP6(μSv/h)	8.307	8.290	8.283	8.303	8.273	8.297	8.260	8.250	8.317	8.227	8.243	8.243	8.243	8.210	8.213	8.243	8.250	8.217	8.240	8.240	8.213	8.197	8.197	8.193
MP7(μSv/h)	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
wind direction	NW	NW	NW	NW	WNW	WNW	WNW	NNW	NW	NW	NNW	NNW	NNW	NW	NW	NW	WNW	WNW	NW	NW	NW	NW	NW	NW
wind speed (m/s)	6.6	4.4	2.3	3.7	5.4	7.4	6.9	5.0	3.6	3.3	3.3	6.6	11.1	7.9	7.6	6.2	6.9	8.6	7.2	6.5	5.3	4.4	5.6	6.1

March 26th, 2011																								
monitoring point	20:00	20:10	20:20	20:30	20:40	20:50	21:00	21:10	21:20	21:30	21:40	21:50	22:00	22:10	22:20	22:30	22:40	22:50	23:00	23:10	23:20	23:30	23:40	23:50
MP1(μSv/h)	10.433	10.423	10.437	10.427	10.423	10.440	10.400	10.360	10.430	10.387	10.370	10.347	10.383	10.370	10.353	10.353	10.363	10.340	10.353	10.343	10.323	10.317	10.323	10.297
MP2(μSv/h)	5.987	5.963	5.953	5.967	5.967	5.947	5.953	5.933	5.933	5.937	5.950	5.923	5.953	5.930	5.910	5.903	5.923	5.900	5.890	5.877	5.907	5.877	5.897	5.897
MP3(μSv/h)	9.953	9.920	9.907	9.923	9.920	9.930	9.890	9.890	9.857	9.873	9.853	9.860	9.840	9.810	9.833	9.847	9.813	9.817	9.800	9.803	9.797	9.777	9.747	9.777
MP4(μSv/h)	7.627	7.577	7.613	7.607	7.597	7.590	7.610	7.570	7.620	7.540	7.567	7.530	7.550	7.560	7.540	7.517	7.513	7.530	7.513	7.513	7.523	7.517	7.510	7.493
MP5(μSv/h)	6.960	7.013	6.960	6.960	6.960	6.967	6.960	6.960	6.960	6.960	6.960	6.913	6.967	6.907	6.913	6.913	6.913	6.887	6.867	6.887	6.913	6.893	6.867	6.867
MP6(μSv/h)	8.167	8.213	8.177	8.180	8.170	8.173	8.187	8.157	8.157	8.130	8.117	8.127	8.127	8.090	8.117	8.120	8.103	8.130	8.090	8.093	8.087	8.073	8.073	8.070
MP7(μSv/h)	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
wind direction	NW	NW	NW	NW	WNW	WNW	WNW	NW	WNW	NW	NW	NW	NW	WNW	W	W	WNW	WNW	WNW	WNW	WNW	WNW	WNW	WNW
wind speed (m/s)	6.7	5.6	5.9	5.5	6.1	6.7	7.4	7.1	8.0	8.5	7.7	6.3	5.1	5.0	5.0	6.8	7.5	8.4	9.4	8.9	8.6	7.8	7.8	9.5

Fukushima Dai-ni (TEPCO's Monitaring Post)

March 26th, 2011																								
monitoring point	00:00	00:10	00:20	00:30	00:40	00:50	01:00	01:10	01:20	01:30	01:40	01:50	02:00	02:10	02:20	02:30	02:40	02:50	03:00	03:10	03:20	03:30	03:40	03:50
MP1(μSv/h)	12.000	11.997	11.893	11.827	11.803	11.773	11.713	11.747	11.680	11.640	11.613	11.600	11.560	11.477	11.473	11.427	11.417	11.330	11.327	11.270	11.213	11.253	11.150	11.160
MP2(μSv/h)	6.910	6.897	6.823	6.780	6.763	6.790	6.757	6.743	6.727	6.693	6.700	6.643	6.617	6.593	6.577	6.517	6.510	6.460	6.447	6.390	6.353	6.347	6.353	6.340
MP3(μSv/h)	11.343	11.310	11.237	11.237	11.183	11.143	11.107	11.140	11.077	11.060	11.017	11.020	10.987	10.953	10.893	10.893	10.877	10.807	10.767	10.723	10.700	10.620	10.630	10.577
MP4(μSv/h)	8.537	8.567	8.523	8.480	8.477	8.460	8.430	8.413	8.393	8.413	8.393	8.343	8.363	8.320	8.313	8.280	8.230	8.200	8.163	8.150	8.120	8.070	8.113	8.063
MP5(μSv/h)	7.947	7.940	7.940	7.893	7.840	7.873	7.847	7.847	7.800	7.833	7.800	7.747	7.747	7.727	7.693	7.700	7.633	7.607	7.547	7.453	7.453	7.453	7.453	7.453
MP6(μSv/h)	9.150	9.100	9.090	9.083	9.040	9.033	9.000	8.977	8.983	8.970	8.957	8.937	8.917	8.857	8.870	8.813	8.827	8.737	8.697	8.643	8.610	8.563	8.550	8.547
MP7(μSv/h)	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
wind direction	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	N	NNW	NNW	NW	NNW	NNW	NW	NNW	NNW	NNW	NNW
wind speed (m/s)	8.2	8.0	8.7	8.1	8.9	7.5	8.3	8.3	8.5	8.3	9.0	9.1	8.8	9.2	8.1	8.1	6.5	9.9	8.6	9.0	9.3	9.9	10.3	10.5

March 26th, 2011																								
monitoring point	04:00	04:10	04:20	04:30	04:40	04:50	05:00	05:10	05:20	05:30	05:40	05:50	06:00	06:10	06:20	06:30	06:40	06:50	07:00	07:10	07:20	07:30	07:40	07:50
MP1(μSv/h)	11.170	11.113	11.153	11.127	11.050	11.037	11.043	11.053	11.000	11.003	11.027	11.030	11.030	10.953	10.993	10.983	10.977	10.963	10.973	10.920	10.937	10.960	10.933	10.917
MP2(μSv/h)	6.330	6.303	6.290	6.283	6.263	6.243	6.277	6.250	6.213	6.263	6.283	6.247	6.247	6.243	6.237	6.227	6.237	6.267	6.227	6.227	6.257	6.237	6.237	6.217
MP3(μSv/h)	10.613	10.580	10.610	10.530	10.487	10.527	10.493	10.503	10.480	10.473	10.470	10.470	10.433	10.440	10.460	10.427	10.410	10.430	10.443	10.437	10.413	10.433	10.447	10.420
MP4(μSv/h)	8.060	8.067	8.037	8.037	8.020	8.003	7.983	7.993	8.000	8.000	7.983	7.943	7.963	7.970	8.017	7.957	7.970	7.970	7.977	7.950	7.963	7.977	7.963	7.943
MP5(μSv/h)	7.347	7.380	7.353	7.353	7.353	7.353	7.347	7.353	7.353	7.353	7.353	7.353	7.353	7.333	7.353	7.327	7.307	7.353	7.353	7.353	7.253	7.353	7.353	7.353
MP6(μSv/h)	8.547	8.547	8.520	8.497	8.477	8.483	8.447	8.460	8.443	8.453	8.463	8.477	8.433	8.443	8.447	8.437	8.437	8.497	8.467	8.467	8.453	8.403	8.453	8.433
MP7(μSv/h)	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
wind direction	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW	NNW
wind speed (m/s)	10.8	9.7	9.7	10.2	9.5	10.1	9.2	9.1	9.4	8.8	8.8	10.0	8.6	8.6	9.2	9.4	9.7	8.5	8.3	7.5	7.0	6.2	5.5	6.3

March 26th, 2011																								
monitoring point	08:00	08:10	08:20	08:30	08:40	08:50	09:00	09:10	09:20	09:30	09:40	09:50	10:00	10:10	10:20	10:30	10:40	10:50	11:00	11:10	11:20	11:30	11:40	11:50
MP1(μSv/h)	10.933	10.933	10.933	10.877	10.920	10.883	10.893	10.910	10.867	10.860	10.893	10.870	10.973	10.903	10.913	10.887	10.850	10.840	10.833	10.873	10.817	10.837	10.803	10.817
MP2(μSv/h)	6.217	6.230	6.213	6.223	6.233	6.220	6.203	6.203	6.183	6.220	6.223	6.217	6.240	6.190	6.183	6.190	6.190	6.177	6.180	6.160	6.173	6.167	6.133	6.163
MP3(μSv/h)	10.437	10.360	10.380	10.370	10.367	10.403	10.340	10.393	10.323	10.380	10.363	10.367	10.320	10.280	10.213	10.233	10.170	10.230	10.237	10.243	10.207	10.217	10.220	10.230
MP4(μSv/h)	7.957	7.933	7.913	7.927	7.930	7.900	7.957	7.933	7.930	7.933	7.913	7.900	7.887	7.813	7.810	7.840	7.833	7.807	7.820	7.837	7.777	7.850	7.863	7.823
MP5(μSv/h)	7.347	7.347	7.253	7.353	7.293	7.273	7.253	7.280	7.353	7.280	7.293	7.253	7.253	7.200	7.207	7.227	7.153	7.180	7.253	7.153	7.253	7.160	7.200	7.153
MP6(μSv/h)	8.420	8.433	8.427	8.440	8.460	8.467	8.433	8.433	8.417	8.427	8.413	8.460	8.437	8.353	8.317	8.337	8.320	8.337	8.340	8.333	8.300	8.357	8.370	8.353
MP7(μSv/h)	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
wind direction	NNW	NNW	NNW	N	N	N	NNW	N	N	N	N	N	N	N	WNW	NW	NW	NW	NNW	NNW	NNW	NW	NW	NW
wind speed (m/s)	7.1	7.3	8.9	7.1	7.9	7.9	8.6	8.2	8.6	8.3	6.6	7.0	6.1	5.8	7.4	6.9	7.4	10.9	12.0	12.8	11.3	10.5	11.1	10.2

Results of envirinmental monitoring at each NPSs etc.

unit: μ Sv/h

Range of normal average value	Company	NPS	March 26th, 2011											
			12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
0.023～0.027	Hokkaido Electric Power Co	Tomari NPS	0.028	0.026	0.032	0.031	0.030	0.026	0.027	0.025	0.025	0.025	0.025	0.033
0.024～0.060	Tohoku Electric Power Co.	Onagawa NPS	0.89	0.88	0.89	0.88	0.86	0.85	0.84	0.84	0.84	0.84	0.83	0.83
0.012～0.060		Higashidori NPS	0.020	0.019	0.018	0.017	0.017	0.018	0.019	0.028	0.021	0.018	0.019	0.019
0.033～0.050	Tokyo Electric Power Co.	Fukushima Dai-ichi※	146.8	146.7	146.9	146.6	145.9	145.3	144.5	143.9	143.0	142.8	141.8	140.9
0.036～0.052		Fukushima Dai-ni	10.157	10.187	10.110	10.103	10.070	10.007	10.000	9.973	9.953	9.890	9.840	9.800
0.011～0.159		Kashiwazaki kariwa NPS	0.065	0.065	0.067	0.065	0.064	0.067	0.065	0.065	0.065	0.065	0.065	0.065
0.036～0.053	Japan Atomic Power Co.	Tokai Dai-ni NPS	0.830	0.827	0.818	0.814	0.813	0.808	0.803	0.805	0.802	0.798	0.798	0.792
0.039～0.110		Tsuruga NPS	0.073	0.078	0.075	0.073	0.076	0.079	0.076	0.076	0.073	0.072	0.078	0.074
0.064～0.108	Chubu Electric Power Co.	Hamaoka NPS	0.079	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.079	0.078
0.0207～0.132	Hokuriku Electric Power Co	Shika NPS	0.033	0.032	0.032	0.033	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.033
0.028～0.130	Chugoku Electric Power Co	Shimane NPS	0.031	0.030	0.032	0.030	0.030	0.030	0.031	0.030	0.030	0.031	0.029	0.032
0.070～0.077	Kansai Electric Power Co.	Mihama NPS	0.072	0.074	0.073	0.073	0.074	0.075	0.073	0.080	0.074	0.072	0.076	0.072
0.045～0.047		Takahama NPS	0.044	0.043	0.043	0.043	0.043	0.043	0.048	0.046	0.043	0.042	0.046	0.044
0.036～0.040		Ooi NPS	0.037	0.036	0.036	0.035	0.035	0.034	0.039	0.037	0.035	0.043	0.038	0.051
0.011～0.080	Shikoku Electeic Power Co.	Ikata NPS	0.014	0.016	0.014	0.014	0.015	0.014	0.014	0.014	0.014	0.015	0.014	0.015
0.023～0.087	Kyushu Electric Power Co.	Genkai NPS	0.027	0.027	0.026	0.026	0.026	0.027	0.026	0.026	0.027	0.027	0.028	0.027
0.034～0.120		Sendai NPS	0.038	0.037	0.037	0.037	0.034	0.037	0.040	0.040	0.039	0.040	0.039	0.036
0.009～0.069	Japan Nuclear Fuel Limited	Japan Nuclear Fuel Reprocessing Plant	0.016	0.017	0.018	0.018	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016
0.009～0.071		Japan Nuclear Fuel Plant Disposal	0.020	0.021	0.023	0.022	0.020	0.020	0.020	0.020	0.021	0.020	0.020	0.020

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

Range of normal average value	Company	NPS	March 27th, 2011											
			00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00
0.023～0.027	Hokkaido Electric Power Co	Tomari NPS	0.029	0.026	0.026	0.025	0.025	0.025	0.025	0.025	0.026	0.026		
0.024～0.060	Tohoku Electric Power Co.	Onagawa NPS	0.83	0.82	0.82	0.81	0.81	0.81	0.81	0.80	0.80	0.79		
0.012～0.060		Higashidori NPS	0.018	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.018		
0.033～0.050	Tokyo Electric Power Co.	Fukushima Dai-ichi※	140.3	140.3	139.9	139.4	137.5	137.1	136.6	136.3	135.8	135.5		
0.036～0.052		Fukushima Dai-ni	9.780	9.753	9.650	9.657	9.637	9.587	9.570	9.473	9.440	9.413		
0.011～0.159		Kashiwazaki kariwa NPS	0.064	0.064	0.065	0.066	0.069	0.068	0.068	0.066	0.065	0.065		
0.036～0.053	Japan Atomic Power Co.	Tokai Dai-ni NPS	0.790	0.788	0.785	0.781	0.784	0.782	0.780	0.776	0.776	0.771		
0.039～0.110		Tsuruga NPS	0.072	0.074	0.072	0.076	0.075	0.073	0.073	0.071	0.074	0.074		
0.064～0.108	Chubu Electric Power Co.	Hamaoka NPS	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078	0.078		
0.0207～0.132	Hokuriku Electric Power Co	Shika NPS	0.033	0.032	0.034	0.033	0.035	0.034	0.032	0.032	0.033	0.033		
0.028～0.130	Chugoku Electric Power Co	Shimane NPS	0.031	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030		
0.070～0.077	Kansai Electric Power Co.	Mihama NPS	0.073	0.074	0.074	0.078	0.074	0.071	0.073	0.071	0.074	0.073		
0.045～0.047		Takahama NPS	0.043	0.044	0.046	0.044	0.044	0.043	0.044	0.043	0.043	0.043		
0.036～0.040		Ooi NPS	0.051	0.049	0.042	0.045	0.041	0.047	0.039	0.035	0.035	0.034		
0.011～0.080	Shikoku Electeic Power Co.	Ikata NPS	0.014	0.014	0.015	0.014	0.014	0.014	0.014	0.014	0.015	0.014		
0.023～0.087	Kyushu Electric Power Co.	Genkai NPS	0.026	0.026	0.026	0.026	0.026	0.027	0.026	0.026	0.026	0.026		
0.034～0.120		Sendai NPS	0.037	0.040	0.037	0.038	0.037	0.037	0.038	0.038	0.040	0.037		
0.009～0.069	Japan Nuclear Fuel Limited	Japan Nuclear Fuel Reprocessing Plant	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016		
0.009～0.071		Japan Nuclear Fuel Plant Disposal	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020		

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

From: RMTPACTSU_ELNRC <RMTPACTSU_ELNRC@ofda.gov>
Sent: Monday, March 28, 2011 8:34 AM
To: LIA02 Hoc; LIA03 Hoc; LIA04 Hoc; ET07 Hoc
Subject: FYI: eInvoice, April 01 for NAKANISHI

Subject: FW: eInvoice, April 01 for NAKANISHI

E-Ticket for your revised return on April 1.

From: MANASSAS TRAVEL [mailto:usaid@manassastravel.com]
Sent: Monday, March 28, 2011 8:27 AM
To: RMTPACTSU_AC; travel
Subject: eInvoice, April 01 for NAKANISHI

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From: OST02 HOC
Sent: Monday, March 28, 2011 11:28 AM
To: PMT02 Hoc; PMT11 Hoc; Hoc, PMT12
Subject: FW: [BVPS-INFO] I-131 detected in standing water
Attachments: image001.jpg

From: HOO Hoc
Sent: Monday, March 28, 2011 9:26 AM
To: LIA07 Hoc; OST01 HOC; OST02 HOC; OST03 HOC
Subject: FW: [BVPS-INFO] I-131 detected in standing water

Headquarters Operations Officer
U.S. Nuclear Regulatory Commission
Phone: 301-816-5100
Fax: 301-816-5151
email: hoo.hoc@nrc.gov
secure e-mail: hoo1@nrc.sgov.gov

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

From: Henderson, Pamela
Sent: Monday, March 28, 2011 8:59 AM
To: HOO Hoc; PMT03 Hoc; Hoc, PMT12
Cc: McNamara, Nancy; Tifft, Doug
Subject: FW: [BVPS-INFO] I-131 detected in standing water

FYI – Beaver Valley I-131

From: Ziev, Tracey
Sent: Saturday, March 26, 2011 3:02 PM
To: Bellamy, Ronald; Henderson, Pamela
Cc: Werkheiser, David; Bonney, Erin; Moslak, Thomas; Barber, Scott; Ziev, Tracey; Powell, Raymond; Dugandzic, Aaron
Subject: [BVPS-INFO] I-131 detected in standing water

Ron and Pam,

Based on inspector guidance on information regarding positive samples for I-131 received on Friday, we are informing you that we asked the licensee to notify NEI of positive I-131 samples that they communicated to us Saturday 3/26 at noon. The licensee intends to communicate those results to NEI on Monday. We also discussed with the licensee the protocol going forward regarding I-131 or other elevated isotopes believed to be tied to the Japanese events.

The FENOC fleet requested Beaver Valley to perform I-131 testing on site and obtained a standing water sample 3/25 at 20:00 (sample was taken near Unit 2 hydrogen farm). The result was 14.98 pCi/L, LLD 7.76e-9

QQQ | 171

3/2/11 (det. cal.). ODCM reporting levels for drinking water is 2pCi/L; non-drinking water is 20pCi/L. The licensee's assessment is that this is not reportable, but it is higher than expected.

The licensee plans to make an Event of Potential Public Interest (EPPI) courtesy call to the three states and counties on Monday.

The licensee contact, Mike Banko, said that PA DEP has communicated to them that their samples were positive for I-131 this most recent sample count for this area.

- Tracey
Beaver Valley visiting inspector

From: LIA07 Hoc
Sent: Monday, March 28, 2011 6:38 PM
To: Borchardt, Bill; Bradford, Anna; Cohen, Shari; Collins, Elmo; Cooper, LaToya; Dyer, Jim; ET07 Hoc; Flory, Shirley; Gibbs, Catina; Haney, Catherine; Hudson, Sharon; Jaczko, Gregory; Johnson, Michael; Leeds, Eric; Loyd, Susan; Pace, Patti; Schwarz, Sherry; Sheron, Brian; Speiser, Herald; Sprogeris, Patricia; Taylor, Renee; Virgilio, Martin; Walker, Dwight; Walls, Lorena; Weber, Michael
Subject: Go Book Update -- 1800 EDT, March 28, 2011
Attachments: TEPCO Press Release 199.pdf; TEPCO Press Release 183.pdf; TEPCO Press Release 184.pdf; TEPCO Press Release 185.pdf; TEPCO Press Release 186.pdf; TEPCO Press Release 187.pdf; TEPCO Press Release 188.pdf; TEPCO Press Release 189.pdf; TEPCO Press Release 190.pdf; TEPCO Press Release 191.pdf; TEPCO Press Release 192.pdf; TEPCO Press Release 193.pdf; TEPCO Press Release 194.pdf; TEPCO Press Release 195.pdf; TEPCO Press Release 196.pdf; TEPCO Press Release 197.pdf; TEPCO Press Release 198.pdf; ET Chronology 3-28-11 1800.pdf; March 28 1500 EDT one pagerFin.docx; USNRC Earthquake-Tsunami Update.032811.1800EDT.pdf

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

The updates include:

- The 1800 EDT, 03/28/11 Status Update
- The latest ET Chronology
- The latest "One Pager" (1500 EDT, 03/28/11)
- TEPCO Press Releases (183-199)

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

-Sara

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

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Search

Press Releases

Press Release (Mar 28,2011)
Status of TEPCO's Facilities and its services after Tohoku-Taiheiyou-Oki Earthquake (as of 9:00AM)

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

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

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

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

*Off-site power was connected to Unit 1 to 6.

* Unit 1
-The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36pm, March 12th.
-We started injection of sea water at 8:20 pm, March 12th, and then boric acid which absorbs neutron into the reactor afterwards.
-At approximately 2:30 am, March 23rd, we started the injection of sea water into the reactor from feed water system. After that, the injection of freshwater was started from 3:37 pm on March 25th (switched from the seawater injection).
-At approximately 10:50 am on March 24th, white smoke was confirmed arising from the top of the reactor building.
-At approximately 11:30 am, March 24th, lights in the main control room were restored.

*Unit 2
-At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in Clause 1, Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (failure of reactor cooling function). At 5:17 pm, March 14th, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation.
-At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there is a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.
Sea water injection to the reactor continued.
-On March 18th, power was delivered up to substation for backup power through offsite transmission line. We completed laying cable further to unit receiving facility in the building, and at 3:46 pm, March 20th the load-side power panel of the receiving facility started to be energized.
-From 3: 05 pm to 5: 20 pm on March 20th, 40 tons of seawater was injected into Unit 2 by TEPCO employees.
-At 6:20 on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level where we could hardly confirm.
-From around 4 pm to 5 pm on March 22nd, approximately 18 tons of sea water was injected into the spent fuel pool by TEPCO employees.
-From 10:30 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated. The work finished at

0:19 pm on March 25th.
-From 10:10 am on March 26th, freshwater (with boric acid) injection was initiated. (switched from the seawater injection) At 06:31PM, Mar 27th, transfer from the fire fighting pump to a temporary motor driven pump was made.
-At approximately 4:46 pm, March 26th, lights in the main control room were restored.

*Unit 3
-At 6:50 am, March 14th, while water injection to the reactor was under operation (injection of boric acid was done on Mar 13th), the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in article 15, clause 1 occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure gradually decreased (as of 9:05 am, 490 kPa).
-At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them were conscious) sustained injuries and were taken to the hospital by ambulances.
-As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered. However the operation on March 16th was cancelled.
-At 6:15 am, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable within a certain range. On March 20th, we were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
-In order to cool spent fuel pool, water was sprayed by helicopters on March 17th with the cooperation of Self-Defense Forces.
-At approximately past 7:00 pm, March 17th, Self-Defense Forces and the police started spraying water by water cannon trucks upon our request for the cooperation. At 8:09 pm, March 17th, they finished the operation.
-At 2:00 pm, March 18th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At 2:45 pm, March 18th, the operation was finished.
-At approximately 0:30 am, March 19th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 1:10 am, March 19th, the operation was finished. They resumed spraying water at 2:10 pm and finished at approximately 3:40 am, March 20th.
-At approximately 9:30 pm, March 20th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 3:58 am, March 21th, they the operation was finished.
-At approximately 3:55 pm, March 21st, light gray smoke was confirmed arising from the southeast side of the 5th floor roof of the Unit 3 building. The situation was reported to the fire department at approximately 4:21 pm. The parameters of reactor pressure vessel, reactor containment vessel, and monitored environmental data remained stable without significant change. However, employees working around Unit 3 evacuated to a safe location. On March 22nd, the color of smoke changed to somewhat white and it is slowly dissipating.
-At approximately 3:10 pm on March 22nd, spraying water to Unit 3 by Tokyo Fire Department's Hyper Rescue and Osaka City Fire Department was conducted, and completed at approximately 4:00 PM on the same day.
-At approximately 10:45 pm on March 22nd, lights in the main operation room were restored.
-At 11:00 am on March 23rd, the injection of sea water to spent fuel pool was conducted, and finished approximately at 1:20 pm on the same day.
-At 4:20 pm on March 23rd, light gray smoke was observed belching from Unit 3 building. The situation was reported to the fire department at 4:25 pm on March 23rd. The parameters of the reactor, the reactor containment vessel of Unit 3, and monitored figures around the site's immediate surroundings remained stable without significant change. To be safe, workers in the main control room of Unit 3 and around Unit 3 evacuated to a safe location. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, TEPCO employees confirmed the smoke has disappeared. Accordingly, workers evacuation was lifted.
-From approximately 5:35 am on March 24th, sea water injection through Fuel Pool Cooling and Filtering System was initiated, and finished at approximately 4:05 pm on the same day.
-From 1:28 pm on March 25th, Hyper Rescue team started water spray. The work finished at 4:00 pm on March 25th.
-From 6:02 pm on March 25th, the injection of freshwater to the reactor was started (switched from the seawater injection).
-At approximately 0:34pm March 27th , Injection of water by concrete pump truck was started. At approximately 2:36 pm, March 27th, the operation was finished.

* Unit 4
-At approximately 6:00 am, March 15th, an explosive sound was heard and

the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4 reactor building was confirmed. At approximately 11:00 am, TEPCO employees confirmed that the fire was out.
-At approximately 5:45 am on March 16th, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approximately 6:15 am, TEPCO staff confirmed at the site that there are no signs of fire.
-At approximately 8:21 am on March 20th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and they finished the operation at approximately 9:40 am. At approximately 6:45 pm spraying water was started by Self-Defenses' water cannon trucks and finished at approximately 7:45 pm.
-At approximately 6:30 am, March 21st, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At approximately 8:40 am, March 21, they had finished the operation.
-On March 21st, cabling has been completed from temporary substation to the main power center.
-From approximately 5:20 pm on March 22nd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 8:30 pm on the same day.
-From approximately 10:00 am on March 23rd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 1:00 pm on the same day.
-From approximately 2:35 pm on March 24th, spraying water by the concrete pumping vehicle was conducted and ended at approximately 5:30 pm on the same day.
-From 6:05 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated and finished at approximately 10:20 am on the same day.
-From 7:05 pm on March 25th, water spray by the concrete pumping vehicle was started and finished at 10:07 pm on March 25th.
-From 4:55 pm on March 27th, water spray by the concrete pumping vehicle was started and finished at 7:25 pm on March 27th.

*Unit 5 and 6
-At 5 am on March 19th, we started the Residual Heat Removal System Pump (C) of Unit 5 in order to cool the spent fuel pool. At 10:14 pm, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
-Unit 5 has been in reactor cold shutdown since 2:30 pm on March 20th. Unit 6 has been in reactor cold shutdown since 7:27 pm on March 20th.
-At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
-At approximately 5:24 pm on March 23rd, the temporary Residual Heat Removal System Seawater Pump automatically stopped when its power source was switched. We restarted the pump at around 4:14 pm, March 24th, and resumed cooling of reactor at around 4:35 pm.

*On March 18th, regarding the spent fuel in the common spent fuel pool, we have confirmed that the water level of the pool is secured. At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
*common spent fuel pool: a spent fuel pool for common use set in a separate building in a plant site in order to preserve spent fuel which are transferred from the spent fuel pool in each Unit building.

*On March 17th, we patrolled buildings for dry casks and found no signs of abnormal situation for the casks by visual observation. A detailed inspection is under preparation.
*dry cask: a measure to store spent fuel in a dry storage casks in storages. Fukushima Daiichi Nuclear Power Station started to utilize the measure from August 1995.

In total 13 fire engines are lent for spraying water to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided.

*On March 24, 2011, it was confirmed that 3 workers from cooperative companies who were in charge of cable laying work in the 1st floor and the underground floor of turbine building were exposed to the radiation dose of more than 170mSv. 2 of them were confirmed that their leg skins were contaminated. Although they were decontaminated by laundering, they were transferred to Fukushima Medical University hospital because there is possibility that they get a burn injury by beta ray. On March 25th, remaining worker was also transferred to Fukushima Medical University hospital. After that, all 3 workers arrived at National Institute of Radiological Sciences in Chiba Prefecture. We will assess radiation dose of 2 worker's skin on their legs by beta ray. We thoroughly instruct our employees and workers of cooperative companies to recognize APD alarm

and evacuate when the alarm rings. We will explain this event, together with appropriate measures to be taken, to the government and to people concerned in order to fully secure the safety in relation to radiation dose management and operations associated with radiation exposure.

*On March 21st, 23rd to 26th, we detected technetium, cobalt, iodine, cesium, tellurium, barium, lanthanum and molybdenum from the seawater around discharge canal of Unit 1, 2, 3 and 4.

*On March 20th, 21st, 23rd to 26th, we detected iodine, cesium, tellurium and ruthenium in the air collected at the site of Fukushima Daiichi Nuclear Power Station.

*We will continuously endeavor to securing safety, and monitoring of the surrounding environment.

Fukushima Daini Nuclear Power Station:
Units 1 to 4: shutdown due to earthquake
*The national government has instructed evacuation for those local residents within 10km radius of the periphery.

*In order to achieve cold shutdown, reactor cooling function was restored and cooling of reactors was conducted. As a result, all reactors achieved cold shutdown: Unit 1 at 5:00 pm, March 14th, Unit 2 at 6:00 pm, March 14th, Unit 3 at 0:15 pm, March 12th, Unit 4 at 7:15 am, March 16th.

*Since March 12th, we had been preparing measures for reducing the pressure of reactor containment vessels (partial discharge of air containing radioactive materials to outside), but on March 17th, we stopped such preparation in all Units.

*(Unit 1)
As it is confirmed that the temperature of the Emergency Equipment Cooling Water System *1 has increased, at 3:20 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 4:25 pm, March 15th, after replacing the power facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

*(Unit 4)
As it is confirmed that the pressure at the outlet of the pumps of the Emergency Equipment Cooling Water System*1 has been decreased, at 8:05 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 9:25 pm, March 15th, after replacing the relevant facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

*1:emergency water system in which cooling water (pure water) circulates which exchanged the heat with sea water in order to cool down bearing pumps and/or heat exchangers etc.

Kashiwazaki Kariwa Nuclear Power Station:
Units 1, 5, 6, 7: normal operation
(Units 2 to 4: outage due to regular inspection)

[Thermal Power Station]
-Hirono Thermal Power Station Units 2 and 4: shutdown due to earthquake
-Hitachinaka Thermal Power Station Unit 1: shutdown due to earthquake
-Kashima Thermal Power Station Units 2, 3, 5, 6: shutdown due to earthquake

[Hydro Power Station]
-All the stations have been restored.
(Facilities damaged by the earthquake are now being repaired in a timely manner.)

[Transmission System, etc.]
-All substation failed due to the earthquake have been restored.
(Facilities damaged by the earthquake are now being repaired in a timely manner.)

[Blackout in TEPCO's Service Area]
-All the blackouts are resolved.

[Supply and Demand Status within TEPCO's Service Area to Secure Stable Power Supply]
-Considering the critical balance of our power supply capacity and expected power demand forward, in order to avoid unexpected blackout, TEPCO has been implementing rolling blackout (planned blackout alternates from one area to another) since Mar 14th. We will make our utmost to secure the stable power supply as early as possible. For customers who will be subject to rolling blackout, please be prepared

for the announced blackout periods. Also for customers who are not subject to blackouts, TEPCO appreciates your continuous cooperation in reducing electricity usage by avoiding using unnecessary lighting and electrical equipment.

[Others]
-Please do NOT touch cut-off electric wires.
-In order to prevent fire, please make sure to switch off the electric appliances such as hair driers when you leave your house.
-For the customer who has in-house power generation, please secure fuel for generator.

Back to page top

Search

Press Releases

Press Release (Mar 28,2011)
Detection of radioactive materials from the seawater around the discharge canal of Fukushima Daiichi Nuclear Power Station (8th release)

On March 21st 2011, radioactive materials were detected from the seawater around the discharge canal (south) of Fukushima Daiichi Nuclear Power Station which was damaged by the 2011 Tohoku-Taiheiyou-Oki Earthquake. This is the result of the sampling survey of radioactive materials in the seawater which was implemented as a part of monitoring activity of surrounding environment. We had informed the result to Nuclear and Industrial Safety Agency (NISA) and Fukushima prefecture.(previously announced)

On March 27th 2011, we had conducted re-sampling survey to examine the effect of radioactive materials in the seawater. Today, we had informed the result to Nuclear and Industrial Safety Agency (NISA) and the government of Fukushima Prefecture, because radioactive materials were detected as shown in the attachment.

We will continue to conduct same kind of sampling survey.

attachment1: The result of the nuclide analysis of the seawater (Around the discharge canal (north) of Unit 5 and 6 Fukushima Daiichi Nuclear Power Station) 8:50 (PDF 7.69KB)
attachment2: The result of the nuclide analysis of the seawater (Around the discharge canal (north) of Unit 5 and 6 Fukushima Daiichi Nuclear Power Station) 14:05 (PDF 7.69KB)
attachment3: The result of the nuclide analysis of the seawater (Around the discharge canal (south) of Fukushima Daiichi Nuclear Power Station) 8:30 (PDF 7.75KB)
attachment4: The result of the nuclide analysis of the seawater (Around the discharge canal (south) of Fukushima Daiichi Nuclear Power Station) 13:50 (PDF 7.75KB)
attachment5: The result of the nuclide analysis of the seawater (Around the north water discharge canal of Fukushima Daini Nuclear Power Station) (PDF 7.66KB)
attachment6: The result of the nuclide analysis of the seawater (Around Iwasawa shore at Fukushima Daini Nuclear Power Station) (PDF 7.61KB)
attachment7: Radioactivity Density of Seawater (PDF 26.3KB)

back to page top

Press Releases

Press Release (Mar 28,2011)
Plant Status of Fukushima Daini Nuclear Power Station (as of 3:00 pm March 28th)

[No update from the last release issued at 9:00 am, March 28th]

Unit	Status
1	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
2	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
3	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
4	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
Other	N.A.

back to page top

Press Releases

Press Release (Mar 28,2011)
Plant Status of Fukushima Daiichi Nuclear Power Station (as of 12:00 AM Mar 28th)

[No update from the last release issued at 8:30 pm, March 27th]

All 6 units of Fukushima Daiichi Nuclear Power Station have been shut down.

Unit 1 (Shut down)
- Explosive sound and white smoke were confirmed after the big quake occurred at 3:36 pm Mar 12th. It was assumed to be hydrogen explosion.
- At approximately 2:30 am on March 23rd, seawater was started to be injected to the nuclear reactor through the feed water system.
- At approximately 10:50 am on March 24th, white fog-like steam arising from the roof part of the reactor building was observed.
- At approximately 11:30 am on March 24th, lights in the main control room was restored.
- We had been injecting sea water into the reactor, but from 3:37 pm on March 25th, we started injecting fresh water into it.

Unit 2 (Shut down)
- At approximately 6:00 am on March 15th, an abnormal noise began emanating from nearby Pressure Suppression Chamber and the pressure within this chamber decreased.
- At 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level to nearly non-existent.
- We have been injecting sea water into the reactor, but from 10:10 am on March 26th, we started injecting fresh water (with boric acid) into it.
- At approximately 4:46 pm on March 26nd, the light in the main control room was turned on.
- Previously, we have been injecting fresh water in to the reactor utilizing fire pump, however, we have switched over to utilizing temporary electrical pump from 6:31 pm on March 27th.

Unit 3 (Shut down)
- Explosive sound and white smoke were confirmed at 11:01am March 4th. It was assumed to be hydrogen explosion.
- At 8:30am on March 16th, fog like steam was confirmed arising from the reactor building.
- At approximately 6:15 am on March 17th the pressure of the Suppression Chamber has temporarily increased. We were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
- At approximately 4:00 pm, March 21st, light gray smoke was confirmed arising from the floor roof of the Unit 3 building. On March 22nd, the color of smoke changed to somewhat white and it is slowly dissipating.
- At approximately 10:45 pm on March 22nd, the light in the main control room was turned on.
- At around 4:20 pm on March 23rd, our staff confirmed light black smoke belching from the Unit 3 building. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, our employee found no signs of smoke.
- We had been injecting sea water into the reactor pressure vessel, but from 6:02 pm on March 25th, we started injecting fresh water into it.

Unit 4 (outage due to regular inspection)
- At approximately 6 am on March 15th, we confirmed the explosive sound and the sustained damage around the 5th floor rooftop area of the Nuclear Reactor Building.
- On March 15th and 16th, we respectively confirmed the outbreak of fire at the 4th floor of the northwestern part of the Nuclear Reactor Building. We immediately reported this matter to the fire department and the related authorities. TEPCO employees confirmed that each fire

had already died down by itself.
- At this moment, we do not consider any reactor coolant leakage inside the reactor happened.

Unit 5 (outage due to regular inspection)
- Sufficient level of reactor coolant to ensure safety is maintained.
- At 5 am, March 19th, we started the Residual Heat Removal System Pump (C) in order to cool the spent fuel pool.
- At 2:30 pm, March 20th, the reactor achieved reactor cold shutdown. At around 5:24 pm on March 23rd, when we switched the temporary Residual Heat Removal System Seawater Pump, it has stopped automatically. At around 4:14 pm, March 24th we replaced the pump, and restarted cooling of reactor at around 4:35 pm.
- At this moment, we do not consider any reactor coolant leakage inside the reactor containment vessel happened.

Unit 6 (outage due to regular inspection)
- Sufficient level of reactor coolant to ensure safety is maintained.
- We completed the repair work on the emergency diesel generator (A).
- At 10:14 pm, March 19th, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
- At 7:27 pm, March 20th, the reactor achieved reactor cold shutdown.
- In relation to the two seawater side pumps of the Residual Heat Removal System, we switched the power source from temporary to permanent at 3:38 PM and 3:42PM, Mar 25 respectively.
- At this moment, we do not consider any reactor coolant leakage inside the reactor containment vessel happened.

Today's work for cooling the spent fuel pools
- We are considering further spraying subject to the conditions of spent fuel pools.

Casualty
- 2 workers of cooperative firm were injured at the occurrence of the earthquake, and were transported to the hospital on March 11th.
- Presence of 2 TEPCO employees at the site is not confirmed on March 11th.
- 1 TEPCO employee who was not able to stand by his own holding left chest with his hand, was transported to the hospital by an ambulance on March 12th.
- 4 workers were injured and transported to the hospital after explosive sound and white smoke were confirmed around the Unit 1on March 12th.
- 1 subcontract worker at the key earthquake-proof building was unconscious and transported to the hospital by an ambulance on March 12th.
- The radiation exposure of 1 TEPCO employee, who was working inside the reactor building, exceeded 100mSv and he was transported to the hospital on March 12th.
- 2 TEPCO employees felt bad during their operation in the central control rooms of Unit 1 and 2 while wearing full masks, and were transferred to Fukushima Daini Nuclear Power Station for consultation with a medical advisor on March 13th.
- 11 workers were injured and transported to Fukushima Daini Nuclear Power Station etc. after explosive sound and white smoke were confirmed around the Unit 3. One of the workers was transported to the Fukushima Medical University Hospital on March 14th.
- At approximately 10 pm on March 22nd, 1 worker who had been working on setting up a temporary power panel in the common pool was injured and transported to Fukushima Daini Nuclear Power Station where the industrial doctor is.
- At approximately 1:30 am on March 23rd, 1 worker who had been working on transporting a temporary power panel in the common pool was injured and transported to Fukushima Daini Nuclear Power Station where the industrial doctor is.
- On March 24th, it was confirmed that 3 workers from cooperative companies who were in charge of cable laying work in the 1st floor and the underground floor of turbine building were exposed to the radiation dose of more than 170 mSv. 2 of them were confirmed that their skins on legs were contaminated. Although they were decontaminated, since there was a possibility of beta ray burn injury, they were transferred to Fukushima Medical University Hospital. The third worker was also transferred to Fukushima Medical University Hospital on March 25th. After that, the 3 workers were transferred to National Institute of Radiological Sciences in Chiba Prefecture.
  Regarding this event, TEPCO has reported to the related government ministries and agencies on measures to be taken to assure appropriate radiation dose control and radiation exposure related operations.
  Before today's restoration work, we will make notification to the concerned parties and continue to take all possible measures to future management.

Others
- We measured radioactive materials (iodine etc.) inside of the nuclear power station area (outdoor) by monitoring car and confirmed that radioactive materials level is getting higher than ordinary level. As listed below, we have determined that specific incidents stipulated in article 15, clause 1 of Act on Special Measures Concerning Nuclear Emergency Preparedness (Abnormal increase in radiation dose measured at site boundary) have occurred.

· Determined at 4:17 pm Mar 12th (Around Monitoring Post 4)
· Determined at 8:56 am Mar 13th (Around Monitoring Post 4)
· Determined at 2:15 pm Mar 13th (Around Monitoring Post 4)
· Determined at 3:50 am Mar 14th (Around Monitoring Post 6)
· Determined at 4:15 am Mar 14th (Around Monitoring Post 2)
· Determined at 9:27 am Mar 14th (Around Monitoring Post 3)
· Determined at 9:37 pm Mar 14th (Around main entrance)
· Determined at 6:51 am Mar 15th (Around main entrance)
· Determined at 8:11 am Mar 15th (Around main entrance)
· Determined at 4:17 pm Mar 15th (Around main entrance)
· Determined at 11:05 pm Mar 15th (Around main entrance)
· Determined at 8:58 am Mar 19th (Around MP5)

From now on, if the measured figure fluctuates and goes above and below 500 micro Sv/h, we deem that as the continuous same event and will not regard that as a new specific incidents stipulated in article 15, clause 1 of the Act on Special Measures Concerning Nuclear Emergency Preparedness (Abnormal increase in radiation dose measured at site boundary) has occurred. In the interim, if we measure a manifestly abnormal figure and it is evident that the event is not the continuous same event, we will determine and notify.

- The national government has instructed evacuation for those local residents within 20km radius of the periphery and evacuation to inside for those residents from 20km to 30km radius of the periphery, because it is possible that radioactive materials are discharged.
- At approximately 10am on March 15th, we observed 400mSv/h at the inland side of the Unit 3 reactor building and 100mSv/h at the inland side of the Unit 4 reactor building.
- At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm (conducted by TEPCO).
- At around 3:37 pm, March 24th, electricity supply to common spent fuel pool has started from external power source. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
- We found no signs of abnormal situation for the casks by visual observation during the patrol activity. A detailed inspection is under preparation.
- At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
- In total 12 fire engines are lent for the water spraying to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments* as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided by Niigata City Fire Headquarter and Hamamatsu City Fire Headquarter.
  *: Koriyama Fire Department, Iwaki Fire Brigade Headquarters, Fire Headquarters of Sukagawa District Wide Area Fire-fighting Association, Yonezawa City Fire Headquarters, Utsunomiya City Fire Headquarters, Fire Headquarters of Aizu-Wakamatsu wide area municipal association, Saitama City Fire Bureau, and Niigata City Fire Bureau.
- By March 22nd, Units 1 through 6 were started to be energized from the external power source.
- We will continue to take all measures to ensure the safety and to continue monitoring the surrounding environment around the Power Station.

Back to page top

Search

Press Releases

Press Release (Mar 28,2011)
Detection of radioactive material in the soil in Fukushima Daiichi Nuclear Power Station

On March 28th 2011, as part of monitoring activity of the surrounding environment, we conducted analysis of plutonium contained in the soil collected on March 21st and 22nd at the 5 spots in Fukushima Daiichi Nuclear Power Station. As a result, plutonium 238, 239 and 240 were detected as shown in the attachment.

We will continue the radionuclide analysis contained in the soil.

‹Results of the analysis›
-Plutonium was detected in the soil of Fukushima Daiichi Nuclear Power Station.
-The density of detected plutonium is equivalent to the fallout observed in Japan when the atmospheric nuclear test was conducted in the past.
-The detected plutonium from two samples out of five may be the direct result of the recent incident, considering their activity ratio of the plutonium isotopes.
-The density of detected plutonium is equivalent to the density in the soil under normal environmental conditions and therefore poses no major impact on human health. TEPCO strengthens environment monitoring inside the station and surrounding areas.
-We will conduct analysis of the three additional soil samples.

attachment1:Result of Pu measurement in the soil in Fukushima Daiichi Nuclear Power Plant(PDF 80.9KB)
attachment2:Fukushima Daiichi Nuclear Power Station Sampling Spots of Soil (PDF 112KB)
attachment3:Fukushima Daiichi Nuclear Power Station Regular Sampling Spots of Soil(PDF 135KB)

Back to page top

March 28, 2011 1500 EDT

Briefing Sheet
Fukushima Daiichi

Plant status updates:

Freshwater injection to Units 1, 2, and 3—believed to be contributing to containment flooding.

Water in the Unit 1 turbine building lower level was pumped into a condenser bay. Significant contamination levels in lower levels of U2 and U3 turbine buildings (isotope analysis indicates communication with reactors). The RST has developed a draft discussion paper on the Potential Leakage Paths to the Turbine Building. This paper is being vetted internally, will be discussed with (GEH, INPO, NR) for comments prior to dispatch to site team. Site team advises that turbine bldg water levels are not increasing. TEPCO is considering pumping the water out of the Turbine building basement for cleanup and recovery.

Planning to install equipment to inert Unit 1 by March 30th.

One train of the Bechtel pumping system is being deployed to the site. Both barges are staged 40 miles from site conducting pump testing. Resupply barge from ship anchored at sea. The Japanese government has requested help with shielding, removal of spent fuel, and robotics. TEPCO has contracted with the Shaw Company for systems for decay heat removal and debris removal. (Source: Site Team).

PMT has engaged with NEI and other industry groups to share radiological information and concerns. NEI is serving as a focal point for collecting U.S. nuclear plant monitoring data in environmental samples, and is developing an online database with data from US plants. NEI has committed to providing NRC a table with information received until the protected web site is online and functioning.

The NRC Reactor Safety Team has provided a coordinated (GEH, EPRI, INPO, NR, DOE) set of recommendations pertaining to severe accident management strategies to the NRC team in Japan. Revisions to the severe accident management strategies are being considered regarding challenges associated with access constraints. Any revision will be fully vetted with all contributing parties.

The EPA commented on NRC recommendations for temporary re-entry into evacuated areas. The comments were incorporated into the original paper, and the paper was re-sent to NSS (WH). PMT is coordinating review of recommendations through series of calls this afternoon.

LT is working to contact NSS (WH) to participate in calls requested by USPACOM regarding radiological conditions at the Fukushim Dai-ichi plants.

PMT provided response to Japan embassy questions on 50 mile evacuation recommendation by US.

The NRC/Consortium call is being re-established at 10:00hrs 29, March.

The Chairman is returning to HQ's departing Japan early on 29 March.

Press Releases

Press Release (Mar 27,2011)
The results of the measurement of puddle of water in the basement of the turbine building of Unit 2 of Fukushima Daiichi Nuclear Power Station(2nd release)

With regard to the captioned result of the measurement that was previously announced, we have judged that the estimation concerning the measured value of ionide-134 was wrong.
Therefore we informed that we would take, analyze and evaluate samples, and announce the results once we have summarized the results.
(previously announced)

Since then we have taken samples and analyzed and evaluated the density of the gamma nuclide including iodine-134, and now we announce the summary of the results of the measurements as shown in the attachment.

Appendix:Result of Contamination Check of Water in the Basement At the Turbine Building of Each Unit 2 of Fukushima Daiichi Power Station(PDF 14.1KB)

Back to page top

Search

Press Releases

Press Release (Mar 28,2011)
The results of nuclide analyses of radioactive materials in the air at the site of Fukushima Daiichi Nuclear Power Station (7th release)

On March 22nd 2011, as part of monitoring activity of the surrounding environment, we conducted nuclide analysis of radioactive materials contained in the air which were collected on March 20th and 21st 2011 at the site of Fukushima Daiichi Nuclear Power Station, which was damaged by Tohoku-Chihou-Taiheiyo-Oki Earthquake. As a result, radioactive materials were detected as shown in the attachment. Therefore, we summarized the results and reported them to Nuclear and Industry Safety Agency as well as to the government of Fukushima Prefecture today. (previously announced)

On March 27th, 2011, we conducted nuclide analysis of radioactive materials contained in the air which were collected on the same date at the site of Fukushima Daiichi Nuclear Power Station. As a result, radioactive materials were detected as shown in the attachment. Therefore, we summarized the results and reported them to Nuclear and Industry Safety Agency as well as to the government of Fukushima Prefecture today.

We will continue the sampling survey the same as this one.

attachment1:The result of the nuclide analysis of radioactive materials in the air at the site of Fukushima Daiichi Nuclear Power Station(PDF 33.9KB)
attachment2:The result of the nuclide analysis of radioactive materials in the air at the site of Fukushima Daini Nuclear Power Station(PDF 34.9KB)
attachment3:Nuclide analysis of radioactive materials in the air Fukushima Daiichi Nuclear Power Station(MP-1)(Main Gate)(PDF 34.1KB)
attachment4:Nuclide analysis of radioactive materials in the air Fukushima Daini Nuclear Power Station(PDF 34.0KB)

back to page top

Press Releases

Press Release (Mar 28,2011)
Plant Status of Fukushima Daiichi Nuclear Power Station (as of 2:00 PM Mar 28th)

[Updates are underlined]

All 6 units of Fukushima Daiichi Nuclear Power Station have been shut down.

Unit 1 (Shut down)
- Explosive sound and white smoke were confirmed after the big quake occurred at 3:36 pm Mar 12th. It was assumed to be hydrogen explosion.
- At approximately 2:30 am on March 23rd, seawater was started to be injected to the nuclear reactor through the feed water system.
- At approximately 10:50 am on March 24th, white fog-like steam arising from the roof part of the reactor building was observed.
- At approximately 11:30 am on March 24th, lights in the main control room was restored.
- We had been injecting sea water into the reactor, but from 3:37 pm on March 25th, we started injecting freshwater into it.

Unit 2 (Shut down)
- At approximately 6:00 am on March 15th, an abnormal noise began emanating from nearby Pressure Suppression Chamber and the pressure within this chamber decreased.
- At 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level to nearly non-existent.
- We have been injecting sea water into the reactor, but from 10:10 am on March 26th, we started injecting fresh water (with boric acid) into it.
- At approximately 4:46 pm on March 26nd, the light in the main control room was turned on.
- Previously, we have been injecting fresh water in to the reactor utilizing fire pump, however, we have switched over to utilizing temporary electrical pump from 6:31 pm on March 27th.

Unit 3 (Shut down)
- Explosive sound and white smoke were confirmed at 11:01am March 4th. It was assumed to be hydrogen explosion.
- At 8:30am on March 16th, fog like steam was confirmed arising from the reactor building.
- At approximately 6:15 am on March 17th the pressure of the Suppression Chamber has temporarily increased. We were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
- At approximately 4:00 pm, March 21st, light gray smoke was confirmed arising from the floor roof of the Unit 3 building. On March 22nd, the color of smoke changed to somewhat white and it is slowly dissipating.
- At approximately 10:45 pm on March 22nd, the light in the main control room was turned on.
- At around 4:20 pm on March 23rd, our staff confirmed light black smoke belching from the Unit 3 building. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, our employee found no signs of smoke.
- We had been injecting sea water into the reactor pressure vessel, but from 6:02 pm on March 25th, we started injecting freshwater into it.

Unit 4 (outage due to regular inspection)
- At approximately 6 am on March 15th, we confirmed the explosive sound and the sustained damage around the 5th floor rooftop area of the Nuclear Reactor Building.
- On March 15th and 16th, we respectively confirmed the outbreak of fire at the 4th floor of the northwestern part of the Nuclear Reactor

Building. We immediately reported this matter to the fire department and the related authorities. TEPCO employees confirmed that each fire had already died down by itself.
- At this moment, we do not consider any reactor coolant leakage inside the reactor happened.

Unit 5 (outage due to regular inspection)
- Sufficient level of reactor coolant to ensure safety is maintained.
- At 5 am, March 19th, we started the Residual Heat Removal System Pump (C) in order to cool the spent fuel pool.
- At 2:30 pm, March 20th, the reactor achieved reactor cold shutdown. At around 5:24 pm on March 23rd, when we switched the temporary Residual Heat Removal System Seawater Pump, it has stopped automatically. At around 4:14 pm, March 24th we replaced the pump, and restarted cooling of reactor at around 4:35 pm.
- At this moment, we do not consider any reactor coolant leakage inside the reactor containment vessel happened.

Unit 6 (outage due to regular inspection)
- Sufficient level of reactor coolant to ensure safety is maintained.
- We completed the repair work on the emergency diesel generator (A).
- At 10:14 pm, March 19th, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
- At 7:27 pm, March 20th, the reactor achieved reactor cold shutdown.
- In relation to the two seawater side pumps of the Residual Heat Removal System, we switched the power source from temporary to permanent at 3:38 PM and 3:42PM, Mar 25 respectively.
- At this moment, we do not consider any reactor coolant leakage inside the reactor containment vessel happened.

Today's work for cooling the spent fuel pools
- We are considering further spraying subject to the conditions of spent fuel pools.

Casualty
- 2 workers of cooperative firm were injured at the occurrence of the earthquake, and were transported to the hospital on March 11th.
- Presence of 2 TEPCO employees at the site is not confirmed on March 11th.
- 1 TEPCO employee who was not able to stand by his own holding left chest with his hand, was transported to the hospital by an ambulance on March 12th.
- 4 workers were injured and transported to the hospital after explosive sound and white smoke were confirmed around the Unit 1on March 12th.
- 1 subcontract worker at the key earthquake-proof building was unconscious and transported to the hospital by an ambulance on March 12th.
- The radiation exposure of 1 TEPCO employee, who was working inside the reactor building, exceeded 100mSv and he was transported to the hospital on March 12th.
- 2 TEPCO employees felt bad during their operation in the central control rooms of Unit 1 and 2 while wearing full masks, and were transferred to Fukushima Daini Nuclear Power Station for consultation with a medical advisor on March 13th.
- 11 workers were injured and transported to Fukushima Daini Nuclear Power Station etc. after explosive sound and white smoke were confirmed around the Unit 3. One of the workers was transported to the Fukushima Medical University Hospital on March 14th.
- At approximately 10 pm on March 22nd, 1 worker who had been working on setting up a temporary power panel in the common pool was injured and transported to Fukushima Daini Nuclear Power Station where the industrial doctor is.
- At approximately 1:30 am on March 23rd, 1 worker who had been working on transporting a temporary power panel in the common pool was injured and transported to Fukushima Daini Nuclear Power Station where the industrial doctor is.
- On March 24th, it was confirmed that 3 workers from cooperative companies who were in charge of cable laying work in the 1st floor and the underground floor of turbine building were exposed to the radiation dose of more than 170 mSv. 2 of them were confirmed that their skins on legs were contaminated. Although they were decontaminated, since there was a possibility of beta ray burn injury, they were transferred to Fukushima Medical University Hospital. The third worker was also transferred to Fukushima Medical University Hospital on March 25th. After that, the 3 workers were transferred to National Institute of Radiological Sciences in Chiba Prefecture. Regarding this event, TEPCO has reported to the related government ministries and agencies on measures to be taken to assure appropriate radiation dose control and radiation exposure related operations. Before today's restoration work, we will make notification to the concerned parties and continue to take all possible measures to future management.

Others
- We measured radioactive materials (iodine etc.) inside of the nuclear power station area (outdoor) by monitoring car and confirmed that radioactive materials level is getting higher than ordinary level.

As listed below, we have determined that specific incidents stipulated in article 15, clause 1 of Act on Special Measures Concerning Nuclear Emergency Preparedness (Abnormal increase in radiation dose measured at site boundary) have occurred.

- Determined at 4:17 pm Mar 12th (Around Monitoring Post 4)
- Determined at 8:56 am Mar 13th (Around Monitoring Post 4)
- Determined at 2:15 pm Mar 13th (Around Monitoring Post 4)
- Determined at 3:50 am Mar 14th (Around Monitoring Post 6)
- Determined at 4:15 am Mar 14th (Around Monitoring Post 2)
- Determined at 9:27 am Mar 14th (Around Monitoring Post 3)
- Determined at 9:37 pm Mar 14th (Around main entrance)
- Determined at 6:51 am Mar 15th (Around main entrance)
- Determined at 8:11 am Mar 15th (Around main entrance)
- Determined at 4:17 pm Mar 15th (Around main entrance)
- Determined at 11:05 pm Mar 15th (Around main entrance)
- Determined at 8:58 am Mar 19th (Around MP5)

From now on, if the measured figure fluctuates and goes above and below 500 micro Sv/h, we deem that as the continuous same event and will not regard that as a new specific incidents stipulated in article 15, clause 1 of the Act on Special Measures Concerning Nuclear Emergency Preparedness (Abnormal increase in radiation dose measured at site boundary) has occurred. In the interim, if we measure a manifestly abnormal figure and it is evident that the event is not the continuous same event, we will determine and notify.

- The national government has instructed evacuation for those local residents within 20km radius of the periphery and evacuation to inside for those residents from 20km to 30km radius of the periphery, because it is possible that radioactive materials are discharged.
- At approximately 10am on March 15th, we observed 400mSv/h at the inland side of the Unit 3 reactor building and 100mSv/h at the inland side of the Unit 4 reactor building.
- At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm (conducted by TEPCO).
- At around 3:37 pm, March 24th, electricity supply to common spent fuel pool has started from external power source. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
- We found no signs of abnormal situation for the casks by visual observation during the patrol activity. A detailed inspection is under preparation.
- At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
- In total 12 fire engines are lent for the water spraying to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments* as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided by Niigata City Fire Headquarter and Hamamatsu City Fire Headquarter.

  *: Koriyama Fire Department, Iwaki Fire Brigade Headquarters, Fire Headquarters of Sukagawa District Wide Area Fire-fighting Association, Yonezawa City Fire Headquarters, Utsunomiya City Fire Headquarters, Fire Headquarters of Aizu-Wakamatsu wide area municipal association, Saitama City Fire Bureau, and Niigata City Fire Bureau.
- By March 22nd, Units 1 through 6 were started to be energized from the external power source.
- At 3:30PM, March 27th, we found that there was water in the trenches of Units 1 to 3. The radioactive emission at the surface of the water was 0.4mSv/h for Unit 1 and over 1,000mSv/h for Unit 2. As for Unit 3, we couldn't have access to the surface because of rubbles. We will continue to monitor water in the trenches.
- We will continue to take all measures to ensure the safety and to continue monitoring the surrounding environment around the Power Station.

Back to page 1

Press Releases

Press Release (Mar 28,2011)
Plant Status of Fukushima Daini Nuclear Power Station (as of 9:00 am March 28th)

[No update from the last release issued at 9:00 pm, March 27th]

Unit	Status
1	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
2	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
3	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
4	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature below 100°C in the Pressure Suppression Chamber.
Other	N.A.

back to page top

Press Releases

Press Release (Mar 28,2011)
Plant Status of Fukushima Daini Nuclear Power Station (as of 9:00 pm March 28th)

[No update from the last release issued at 3:00 pm, March 28th]

Unit Status

1
- Reactor cold shutdown, stable water level, offsite power is available.
- No reactor coolant is leaked to the reactor containment vessel.
- Maintain average water temperature below 100°C in the Pressure Suppression Chamber.

2
- Reactor cold shutdown, stable water level, offsite power is available.
- No reactor coolant is leaked to the reactor containment vessel.
- Maintain average water temperature below 100°C in the Pressure Suppression Chamber.

3
- Reactor cold shutdown, stable water level, offsite power is available.
- No reactor coolant is leaked to the reactor containment vessel.
- Maintain average water temperature below 100°C in the Pressure Suppression Chamber.

4
- Reactor cold shutdown, stable water level, offsite power is available.
- No reactor coolant is leaked to the reactor containment vessel.
- Maintain average water temperature below 100°C in the Pressure Suppression Chamber.

Other N.A.

Back to page top

Press Releases

Press Release (Mar 27,2011)
Plant Status of Fukushima Daiichi Nuclear Power Station (as of 8:30 PM Mar 27th)

All 6 units of Fukushima Daiichi Nuclear Power Station have been shut down.

Unit 1 (Shut down)
-Explosive sound and white smoke were confirmed after the big quake occurred at 3:36 pm Mar 12th. It was assumed to be hydrogen explosion.
-At approximately 2:30 am on March 23rd, seawater was started to be injected to the nuclear reactor through the feed water system.
-At approximately 10:50 am on March 24th, white fog-like steam arising from the roof part of the reactor building was observed.
-At approximately 11:30 am on March 24th, lights in the main control room was restored.
-We had been injecting sea water into the reactor, but from 3:37 pm on March 25th, we started injecting fresh water into it.

Unit 2 (Shut down)
-At approximately 6:00 am on March 15th, an abnormal noise began emanating from nearby Pressure Suppression Chamber and the pressure within this chamber decreased.
-At 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level to nearly non-existent.
-We have been injecting sea water into the reactor, but from 10:10 am on March 26th, we started injecting fresh water (with boric acid) into it.
-At approximately 4:46 pm on March 26th, the light in the main control room was turned on.
-Previously, we have been injecting fresh water in to the reactor utilizing fire pump, however, we have switched over to utilizing temporary electrical pump from 6:31 pm on March 27th.

Unit 3 (Shut down)
-Explosive sound and white smoke were confirmed at 11:01am March 4th. It was assumed to be hydrogen explosion.
-At 8:30am on March 16th, fog like steam was confirmed arising from the reactor building.
-At approximately 6:15 am on March 17th the pressure of the Suppression Chamber has temporarily increased. We were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
-At approximately 4:00 pm, March 21st, light gray smoke was confirmed arising from the floor roof of the Unit 3 building. On March 22nd, the color of smoke changed to somewhat white and it is slowly dissipating.
-At approximately 10:45 pm on March 22nd, the light in the main control room was turned on.
-At around 4:20 pm on March 23rd, our staff confirmed light black smoke belching from the Unit 3 building. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, our employee found no signs of smoke.
-We had been injecting sea water into the reactor pressure vessel, but from 6:02 pm on March 25th, we started injecting fresh water into it.

Unit 4 (outage due to regular inspection)
-At approximately 6 am on March 15th, we confirmed the explosive sound and the sustained damage around the 5th floor rooftop area of the Nuclear Reactor Building.
-On March 15th and 16th, we respectively confirmed the outbreak of fire at the 4th floor of the northwestern part of the Nuclear Reactor Building. We immediately reported this matter to the fire department and the related authorities. TEPCO employees confirmed that each fire had already died down by itself.
-At this moment, we do not consider any reactor coolant leakage inside the

reactor happened.

Unit 5 (outage due to regular inspection)
-Sufficient level of reactor coolant to ensure safety is maintained.
-At 5 am, March 19th, we started the Residual Heat Removal System Pump (C) in order to cool the spent fuel pool.
-At 2:30 pm, March 20th, the reactor achieved reactor cold shutdown. At around 5:24 pm on March 23rd, when we switched the temporary Residual Heat Removal System Seawater Pump, it has stopped automatically. At around 4:14 pm, March 24th we replaced the pump, and restarted cooling of reactor at around 4:35 pm.
-At this moment, we do not consider any reactor coolant leakage inside the reactor containment vessel happened.

Unit 6 (outage due to regular inspection)
-Sufficient level of reactor coolant to ensure safety is maintained.
-We completed the repair work on the emergency diesel generator (A).
-At 10:14 pm, March 19th, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
-At 7:27 pm, March 20th, the reactor achieved reactor cold shutdown.
-In relation to the two seawater side pumps of the Residual Heat Removal System, we switched the power source from temporary to permanent at 3:38 PM and 3:42PM, Mar 25 respectively.
-At this moment, we do not consider any reactor coolant leakage inside the reactor containment vessel happened.

Today's work for cooling the spent fuel pools
-In Unit 3, water spraying was conducted utilizing concrete pump vehicle from 12:34 pm, March 27th and finished at 2:36 pm the same day.
-In Unit 4, water spraying was conducted utilizing concrete pump vehicle from 4:34 pm, March 27th and finished at 7:25 pm the same day.
-We are considering further spraying subject to the conditions of spent fuel pools.

Casualty
-2 workers of cooperative firm were injured at the occurrence of the earthquake, and were transported to the hospital on March 11th.
-Presence of 2 TEPCO employees at the site is not confirmed on March 11th.
-1 TEPCO employee who was not able to stand by his own holding left chest with his hand, was transported to the hospital by an ambulance on March 12th.
-4 workers were injured and transported to the hospital after explosive sound and white smoke were confirmed around the Unit 1on March 12th.
-1 subcontract worker at the key earthquake-proof building was unconscious and transported to the hospital by an ambulance on March 12th.
-The radiation exposure of 1 TEPCO employee, who was working inside the reactor building, exceeded 100mSv and he was transported to the hospital on March 12th.
-2 TEPCO employees felt bad during their operation in the central control rooms of Unit 1 and 2 while wearing full masks, and were transferred to Fukushima Daini Nuclear Power Station for consultation with a medical advisor on March 13th.
-11 workers were injured and transported to Fukushima Daini Nuclear Power Station etc. after explosive sound and white smoke were confirmed around the Unit 3. One of the workers was transported to the Fukushima Medical University Hospital on March 14th.
-At approximately 10 pm on March 22nd, 1 worker who had been working on setting up a temporary power panel in the common pool was injured and transported to Fukushima Daini Nuclear Power Station where the industrial doctor is.
-At approximately 1:30 am on March 23rd, 1 worker who had been working on transporting a temporary power panel in the common pool was injured and transported to Fukushima Daini Nuclear Power Station where the industrial doctor is.
-On March 24th, it was confirmed that 3 workers from cooperative companies who were in charge of cable laying work in the 1st floor and the underground floor of turbine building were exposed to the radiation dose of more than 170 mSv. 2 of them were confirmed that their skins on legs were contaminated. Although they were decontaminated, since there was a possibility of beta ray burn injury, they were transferred to Fukushima Medical University Hospital. The third worker was also transferred to Fukushima Medical University Hospital on March 25th. After that, the 3 workers were transferred to National Institute of Radiological Sciences in Chiba Prefecture.
Regarding this event, TEPCO has reported to the related government ministries and agencies on measures to be taken to assure appropriate radiation dose control and radiation exposure related operations. Before today's restoration work, we will make notification to the concerned parties and continue to take all possible measures to future management.

Others
-We measured radioactive materials (iodine etc.) inside of the nuclear power station area (outdoor) by monitoring car and confirmed that radioactive materials level is getting higher than ordinary level. As listed below, we have determined that specific incidents stipulated in article 15, clause 1 of Act on Special Measures Concerning Nuclear

Emergency Preparedness (Abnormal increase in radiation dose measured at site boundary) have occurred.
·Determined at 4:17 pm Mar 12th (Around Monitoring Post 4)
·Determined at 8:56 am Mar 13th (Around Monitoring Post 4)
·Determined at 2:15 pm Mar 13th (Around Monitoring Post 4)
·Determined at 3:50 am Mar 14th (Around Monitoring Post 6)
·Determined at 4:15 am Mar 14th (Around Monitoring Post 2)
·Determined at 9:27 am Mar 14th (Around Monitoring Post 3)
·Determined at 9:37 pm Mar 14th (Around main entrance)
·Determined at 6:51 am Mar 15th (Around main entrance)
·Determined at 8:11 am Mar 15th (Around main entrance)
·Determined at 4:17 pm Mar 15th (Around main entrance)
·Determined at 11:05 pm Mar 15th (Around main entrance)
·Determined at 8:58 am Mar 19th (Around MP5)

From now on, if the measured figure fluctuates and goes above and below 500 micro Sv/h, we deem that as the continuous same event and will not regard that as a new specific incidents stipulated in article 15, clause 1 of the Act on Special Measures Concerning Nuclear Emergency Preparedness (Abnormal increase in radiation dose measured at site boundary) has occurred. In the interim, if we measure a manifestly abnormal figure and it is evident that the event is not the continuous same event, we will determine and notify.

-The national government has instructed evacuation for those local residents within 20km radius of the periphery and evacuation to inside for those residents from 20km to 30km radius of the periphery, because it is possible that radioactive materials are discharged.
-At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm (conducted by TEPCO).
-At around 3:37 pm, March 24th, electricity supply to common spent fuel pool has started from external power source. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
-We found no signs of abnormal situation for the casks by visual observation during the patrol activity. A detailed inspection is under preparation.
-At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
-In total 12 fire engines are lent for the water spraying to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments* as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided by Niigata City Fire Headquarter and Hamamatsu City Fire Headquarter.
*: Koriyama Fire Department, Iwaki Fire Brigade Headquarters, Fire Headquarters of Sukagawa District Wide Area Fire-fighting Association, Yonezawa City Fire Headquarters, Utsunomiya City Fire Headquarters, Fire Headquarters of Aizu-Wakamatsu wide area municipal association, Saitama City Fire Bureau, and Niigata City Fire Bureau.
-By March 22nd, Units 1 through 6 were started to be energized from the external power source.
-We will continue to take all measures to ensure the safety and to continue monitoring the surrounding environment around the Power Station.

back to page top

Press Releases

Press Release (Mar 27,2011)
Plant Status of Fukushima Daini Nuclear Power Station (as of 9:00 pm March 27th)

[No update from the last release issued at 3:00 pm, March 27th]

Unit	Status
1	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature at 100°C in the Pressure Suppression Chamber.
2	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature at 100°C in the Pressure Suppression Chamber.
3	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature at 100°C in the Pressure Suppression Chamber.
4	· Reactor cold shutdown, stable water level, offsite power is available. · No reactor coolant is leaked to the reactor containment vessel. · Maintain average water temperature at 100°C in the Pressure Suppression Chamber.
Other	N.A.

back to page top

Press Releases

Press Release (Mar 28,2011)
Detection of radioactive material in the soil in Fukushima Daiichi Nuclear Power Station

On March 28th 2011, as part of monitoring activity of the surrounding environment, we conducted analysis of plutonium contained in the soil collected on March 21st and 22nd at the 5 spots in Fukushima Daiichi Nuclear Power Station. As a result, plutonium 238, 239 and 240 were detected as shown in the attachment.

We will continue the radionuclide analysis contained in the soil.

‹Results of the analysis›
-Plutonium was detected in the soil of Fukushima Daiichi Nuclear Power Station.
-The density of detected plutonium is equivalent to the fallout observed in Japan when the atmospheric nuclear test was conducted in the past.
-The detected plutonium from two samples out of five may be the direct result of the recent incident, considering their activity ratio of the plutonium isotopes.
-The density of detected plutonium is equivalent to the density in the soil under normal environmental conditions and therefore poses no major impact on human health. TEPCO strengthens environment monitoring inside the station and surrounding areas.
-We will conduct analysis of the three additional soil samples.

attachment1:Result of Pu measurement in the soil in Fukushima Daiichi Nuclear Power Plant(PDF 80.9KB)
attachment2:Fukushima Daiichi Nuclear Power Station Sampling Spots of Soil (PDF 112KB)
attachment3:Fukushima Daiichi Nuclear Power Station Regular Sampling Spots of Soil(PDF 135KB)

back to page top

Search

Press Releases

Press Release (Mar 28,2011)
Plant Status of Fukushima Daiichi Nuclear Power Station (as of 8:30 PM Mar 28th)

*Updates are underlined

All 6 units of Fukushima Daiichi Nuclear Power Station have been shut down.

Unit 1(Shut down)
-Explosive sound and white smoke were confirmed after the big quake occurred at 3:36 pm Mar 12th. It was assumed to be hydrogen explosion.
-At approximately 2:30 am on March 23rd, seawater injection to the nuclear reactor through the feed water system was initiated.
-At approximately 10:50 am on March 24th, white fog-like steam arising from the roof part of the reactor building was observed.
-At approximately 11:30 am on March 24th, lights in the main control room was restored.
-We had been injecting seawater into the reactor, but from 3:37 pm on March 25th, we started injecting freshwater.

Unit 2(Shut down)
-At approximately 6:00 am on March 15th, an abnormal noise began emanating from nearby Pressure Suppression Chamber and the pressure within the chamber decreased.
-At 6:20 pm on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level to nearly non-existent.
-We have been injecting seawater into the reactor, but from 10:10 am on March 26th, we started injecting fresh water (with boric acid).
-At approximately 4:46 pm on March 26th, the light in the main control room was restored.
-We had been injecting fresh water in to the reactor utilizing fire pump, however, we switched over to utilizing temporary electrical pump from 6:31 pm on March 27th.

Unit 3(Shut down)
-Explosive sound and white smoke were confirmed at 11:01am March 4th. It was assumed to be hydrogen explosion.
-At 8:30am on March 16th, fog like steam was confirmed arising from the reactor building.
-At approximately 6:15 am on March 17th the pressure of the Suppression Chamber has temporarily increased. We were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
-At approximately 4:00 pm, March 21st, light gray smoke was confirmed arising from the floor roof of the Unit 3 building. On March 22nd, the color of smoke changed to somewhat white and it is slowly dissipating.
-At approximately 10:45 pm on March 22nd, the light in the main control room was turned on.
-At around 4:20 pm on March 23rd, our staff confirmed light black smoke belching from the Unit 3 building. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, our employee found no signs of smoke.
-We had been injecting sea water into the reactor pressure vessel, but from 6:02 pm on March 25th, we started injecting freshwater.
-We had been injecting fresh water in to the reactor utilizing fire pump, however, we switched over to utilizing temporary electrical pump from 8:30 pm on March 28th.

Unit 4 (outage due to regular inspection)
-At approximately 6 am on March 15th, we confirmed the explosive sound and the sustained damage around the 5th floor rooftop area of the Nuclear Reactor Building.
-On March 15th and 16th, we respectively confirmed the outbreak of fire at

the 4th floor of the northwestern part of the Nuclear Reactor Building. We immediately reported this matter to the fire department and the related authorities. TEPCO employees confirmed that each fire had already died down by itself.
-At this moment, we do not consider any reactor coolant leakage inside the reactor happened.

Unit 5 (outage due to regular inspection)
-Sufficient level of reactor coolant to ensure safety is maintained.
-At 5 am, March 19th, we started the Residual Heat Removal System Pump (C) in order to cool the spent fuel pool.
-At 2:30 pm, March 20th, the reactor achieved reactor cold shutdown. At around 5:24 pm on March 23rd, when we switched the temporary Residual Heat Removal System Seawater Pump, it has stopped automatically. At around 4:14 pm, March 24th we replaced the pump, and restarted cooling of reactor at around 4:35 pm.
-At this moment, we do not consider any reactor coolant leakage inside the reactor happened.

Unit 6 (outage due to regular inspection)
-Sufficient level of reactor coolant to ensure safety is maintained.
-We completed the repair work on the emergency diesel generator (A).
-At 10:14 pm, March 19th, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
-At 7:27 pm, March 20th, the reactor achieved reactor cold shutdown.
-In relation to the two seawater side pumps of the Residual Heat Removal System, we switched the power source from temporary to permanent at 3:38 PM and 3:42PM, Mar 25 respectively.
-At this moment, we do not consider any reactor coolant leakage inside the reactor happened.

Today's work for cooling the spent fuel pools
-We are considering further spraying subject to the conditions of spent fuel pools.

Casualty
-Presence of 2 TEPCO employees at the site is not confirmed on March 11th.
-On March 24th, it was confirmed that 3 workers from cooperative companies who were in charge of cable laying work in the 1st floor and the underground floor of turbine building were exposed to the radiation dose of more than 170 mSv. 2 of them were confirmed that their skins on legs were contaminated. After they were decontaminated, since there was a possibility of beta ray burn injury, they were transferred to Fukushima Medical University Hospital. The third worker was also transferred to Fukushima Medical University Hospital on March 25th. Later, the 3 workers were transferred to National Institute of Radiological Sciences in Chiba Prefecture. They all left the hospital on March 28th.
Regarding this event, TEPCO has reported to the related government ministries and agencies on measures to be taken to assure appropriate radiation dose control and radiation exposure related operations.
We will inform the related parties of countermeasures and continue to take all possible measures to future management.

Others
-We measured radioactive materials (iodine etc.) inside of the nuclear power station area (outdoor) by monitoring car and confirmed that radioactive materials level is getting higher than ordinary level. As listed below, we have determined that specific incidents stipulated in article 15, clause 1 of Act on Special Measures Concerning Nuclear Emergency Preparedness (Abnormal increase in radiation dose measured at site boundary) have occurred.
·Determined at 4:17 pm Mar 12th (Around Monitoring Post 4)
·Determined at 8:56 am Mar 13th (Around Monitoring Post 4)
·Determined at 2:15 pm Mar 13th (Around Monitoring Post 4)
·Determined at 3:50 am Mar 14th (Around Monitoring Post 6)
·Determined at 4:15 am Mar 14th (Around Monitoring Post 2)
·Determined at 9:27 am Mar 14th (Around Monitoring Post 3)
·Determined at 9:37 pm Mar 14th (Around main entrance)
·Determined at 6:51 am Mar 15th (Around main entrance)
·Determined at 8:11 am Mar 15th (Around main entrance)
·Determined at 4:17 pm Mar 15th (Around main entrance)
·Determined at 11:05 pm Mar 15th (Around main entrance)
·Determined at 8:58 am Mar 19th (Around MP5)
From now on, if the measured figure fluctuates and goes above and below 500 micro Sv/h, we deem that as the continuous same event and will not regard that as a new specific incidents stipulated in article 15, clause 1 of the Act on Special Measures Concerning Nuclear Emergency Preparedness (Abnormal increase in radiation dose measured at site boundary) has occurred. In the interim, if we measure a manifestly abnormal figure and it is evident that the event is not the continuous same event, we will determine and notify.

-The national government has instructed evacuation for those local residents within 20km radius of the periphery and evacuation to inside for those residents from 20km to 30km radius of the periphery, because it is possible that radioactive materials are discharged.
-At around 10:37 am March 21st, water spraying to common spent fuel pool

and finished at 3:30 pm (conducted by TEPCO).
-At around 3:37 pm, March 24th, electricity supply to common spent fuel pool has started from external power source. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
-We found no signs of abnormal situation for the casks by visual observation during the patrol activity. A detailed inspection is under preparation.
-At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
-In total 12 fire engines are lent for the water spraying to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments* as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided by Niigata City Fire Headquarter and Hamamatsu City Fire Headquarter.
*: Koriyama Fire Department, Iwaki Fire Brigade Headquarters, Fire] Headquarters of Sukagawa District Wide Area Fire-fighting Association, Yonezawa City Fire Headquarters, Utsunomiya City Fire Headquarters, Fire Headquarters of Aizu-Wakamatsu wide area municipal association, Saitama City Fire Bureau, and Niigata City Fire Bureau.
-By March 22nd, Units 1 through 6 were started to be energized from the external power source.
-At 3:30PM, March 27th, we found that there was water in the trenches of Units 1 to 3. The radioactive emission at the surface of the water was 0.4mSv/h for Unit 1 and over 1,000mSv/h for Unit 2. As for Unit 3, we couldn't have access to the surface because of debris. We will continue to monitor water in the trenches.
-We will continue to take all measures to ensure the safety and to continue monitoring the surrounding environment around the Power Station.

back to page top

Search

Press Releases

Press Release (Mar 28,2011)
Implementation Plan of Rolling Blackouts on and after March 29, 2011

Due to the tight power supply-demand balance, TEPCO has been implementing rolling blackout since Monday, March 14. We sincerely regret causing anxiety and inconvenience to our customers and the society. We appreciate your cooperation in conserving electricity consumption.
For customers who will be subject to rolling blackouts, please be prepared for the announced blackout periods. Also, for the customers who are not subject to blackouts, we would appreciate your continuous cooperation in reducing electricity usage by turning off unnecessary lightings and electrical appliances.
We will inform the implementation plan of rolling blackouts on and after March 29, 2011 as follows:

oImplementation plan of rolling blackout on March 29 (Tues.)
On March 29, Tuesday, no rolling blackout will be implemented in any time periods based on the today's power demand, the weather forecast on March 29 and the trend of the power supply.

oImplementation plan of rolling blackout on March 30 (Wed.)- April 4(Mon.)
Please refer to the appendix 2 for details.

- •The actual blackout period for each Group is planned to be maximum about 3 hours during the relevant scheduled time period.
- •Each blackout period for each Group differs every day and starting and ending time of blackout periods may slightly differ.
- •Depending on the supply-demand balance of the day, planned blackouts may not be carried out. In case the electricity supply-demand balance becomes tighter than expected, we will reconsider the rolling blackout plan and inform you accordingly before we implement the revised plan.
- •A blackout may occur in the adjacent areas where the planned blackouts are carried out

[Others]
- •In order to prevent fires, please make sure to switch off electric appliances such as hair driers when you leaving home.
- •Please carefully pay attention to the traffic at the crossings in case the traffic lights are suddenly turned off.
- •As for the buildings and apartments, please be aware that equipments and facilities such as elevators, automatic doors, automatic locks, and multilevel parking lots will not function. In particular, please avoid using elevators during the scheduled blackouts.

‹Reference›
oPrediction of demand and supply on March 28
Estimated Demand 37,500 MW (18:00-19:00)
Supply Capacity 38,500 MW

oPrediction of demand and supply on March 29
Estimated Demand 36,000 MW (18:00-19:00)
Supply Capacity 38,500 MW

*Prediction of demand
According to the weather forecast, the temperature tomorrow on March 29 will be higher than that of today. We assume the estimated peak demand on March 29 will be 36,000MW.
*Estimated demand and supply capacity may change depending on the situation of the day.

Appendix1:Rolling Blackout Tentative Plan on Mar 29 (Tue)(PDF 86.4KB)
Appendix2:Weekly Rolling Blackout Tentative Plan from Mar 29(Tue)to April 4(Mon)(PDF 20.2KB)

back to page top

Press Releases

Press Release (Mar 27,2011)
The results of the measurement of puddle of water in the basement of the turbine building of Unit 2 of Fukushima Daiichi Nuclear Power Station

With regard to the captioned result of the measurement that was previously announced, we have judged that the estimation concerning the measured value of ionide-134 was wrong.

Therefore we informed that we would take, analyze and evaluate samples, and announce the results once we have summarized the results.

back to page top

Press Releases

Press Release (Mar 28,2011)
Status of TEPCO's Facilities and its services after Tohoku-Taiheiyou-Oki Earthquake (as of 4:00PM)

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

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

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

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

*Off-site power was connected to Unit 1 to 6.

*Unit 1
- The explosive sound and white smoke was confirmed near Unit 1 when the big quake occurred at 3:36pm, March 12th.
- We started injection of sea water at 8:20 pm, March 12th, and then boric acid which absorbs neutron into the reactor afterwards.
- At approximately 2:30 am, March 23rd, we started the injection of sea water into the reactor from feed water system. After that, the injection of freshwater was started from 3:37 pm on March 25th (switched from the seawater injection).
- At approximately 10:50 am on March 24th, white smoke was confirmed arising from the top of the reactor building.
- At approximately 11:30 am, March 24th, lights in the main control room were restored.

*Unit 2
- At 1:25 pm, March 14th, since the Reactor Core Isolation Cooling System has failed, it was determined that a specific incident stipulated in Clause 1, Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness occurred (failure of reactor cooling function). At 5:17 pm, March 14th, while the water level in the reactor reached the top of the fuel rod, we have restarted the water injection with the valve operation.
- At approximately 6:14 am, March 15th, the abnormal sound was confirmed near the suppression chamber and the pressure inside the chamber decreased afterwards. It was determined that there is a possibility that something happened in the suppression chamber. While sea water injection to the reactor continued, TEPCO employees and workers from other companies not in charge of injection work started tentative evacuation to a safe location.
  Sea water injection to the reactor continued.
- On March 18th, power was delivered up to substation for backup power through offsite transmission line. We completed laying cable further to unit receiving facility in the building, and at 3:46 pm, March 20th the load-side power panel of the receiving facility started to be energized.
- From 3:05 pm to 5:20 pm on March 20th, 40 tons of seawater was injected into Unit 2 by TEPCO employees.
- At 6:20 on March 21st, white smoke was confirmed arising from the top of the reactor building. As of 7:11 am on March 22nd, smoke decreased to the level where we could hardly confirm.
- From around 4 pm to 5 pm on March 22nd, approximately 18 tons of sea water was injected into the spent fuel pool by TEPCO employees.
- From 10:30 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated. The work finished at 0:19 pm

on March 25th.
- From 10:10 am on March 26th, freshwater (with boric acid) injection was initiated. (switched from the seawater injection) At 06:31PM, Mar 27th, transfer from the fire fighting pump to a temporary motor driven pump was made.
- At approximately 4:46 pm, March 26th, lights in the main control room were restored.

*Unit 3
- At 6:50 am, March 14th, while water injection to the reactor was under operation (injection of boric acid was done on Mar 13th), the pressure in the reactor containment vessel increased to 530 kPa. As a result, at 7:44 am, it was determined that a specific incident stipulated in article 15, clause 1 occurred (abnormal increase of the pressure of reactor containment vessel). Afterwards, the pressure gradually decreased (as of 9:05 am, 490 kPa).
- At approximately 11:01 am, March 14th, an explosion followed by white smoke occurred near Unit 3. 4 TEPCO employees and 3 workers from other companies (all of them were conscious) sustained injuries and were taken to the hospital by ambulances.
- As the temperature of water in the spent fuel pool rose, spraying water by helicopters with the support of the Self Defense Force was considered. However the operation on March 16th was cancelled.
- At 6:15 am, March 17th, the pressure of the Suppression Chamber temporarily increased, but currently it is stable within a certain range. On March 20th, we were preparing to implement measures to reduce the pressure of the reactor containment vessel (partial discharge of air containing radioactive material to outside) in order to fully secure safety. However, at present, it is not a situation to immediately implement measures and discharge air containing radioactive material to outside. We will continue to monitor the status of the pressure of the reactor containment vessel.
- In order to cool spent fuel pool, water was sprayed by helicopters on March 17th with the cooperation of Self-Defense Forces.
- At approximately past 7:00 pm, March 17th, Self-Defense Forces and the police started spraying water by water cannon trucks upon our request for the cooperation. At 8:09 pm, March 17th, they finished the operation.
- At 2:00 pm, March 18th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At 2:45 pm, March 18th, the operation was finished.
- At approximately 0:30 am, March 19th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 1:10 am, March 19th, the operation was finished. They resumed spraying water at 2:10 pm and finished at approximately 3:40 am, March 20th.
- At approximately 9:30 pm, March 20th, spraying water was started with the cooperation of Fire Rescue Task Forces of Tokyo Fire Department. At approximately 3:58 am, March 21th, they the operation was finished.
- At approximately 3:55 pm, March 21st, light gray smoke was confirmed arising from the southeast side of the 5th floor roof of the Unit 3 building. The situation was reported to the fire department at approximately 4:21 pm. The parameters of reactor pressure vessel, reactor containment vessel, and monitored environmental data remained stable without significant change. However, employees working around Unit 3 evacuated to a safe location. On March 22nd, the color of smoke changed to somewhat white and it is slowly dissipating.
- At approximately 3:10 pm on March 22nd, spraying water to Unit 3 by Tokyo Fire Department's Hyper Rescue and Osaka City Fire Department was conducted, and completed at approximately 4:00 PM on the same day.
- At approximately 10:45 pm on March 22nd, lights in the main operation room were restored.
- At 11:00 am on March 23rd, the injection of sea water to spent fuel pool was conducted, and finished approximately at 1:20 pm on the same day.
- At 4:20 pm on March 23rd, light gray smoke was observed belching from Unit 3 building. The situation was reported to the fire department at 4:25 pm on March 23rd. The parameters of the reactor, the reactor containment vessel of Unit 3, and monitored figures around the site's immediate surroundings remained stable without significant change. To be safe, workers in the main control room of Unit 3 and around Unit 3 evacuated to a safe location. At approximately 11:30 pm on March 23rd and 4:50 am on March 24th, TEPCO employees confirmed the smoke has disappeared. Accordingly, workers evacuation was lifted.
- From approximately 5:35 am on March 24th, sea water injection through Fuel Pool Cooling and Filtering System was initiated, and finished at approximately 4:05 pm on the same day.
- From 1:28 pm on March 25th, Hyper Rescue team started water spray. The work finished at 4:00 pm on March 25th.
- From 6:02 pm on March 25th, the injection of freshwater to the reactor was started (switched from the seawater injection).
- At approximately 0:34pm March 27th , Injection of water by concrete pump truck was started. At approximately 2:36 pm, March 27th, the operation was finished.

*Unit 4
- At approximately 6:00 am, March 15th, an explosive sound was heard and the damage in the 5th floor roof of Unit 4 reactor building was confirmed. At 9:38 am, the fire near the north-west part of 4th floor of Unit 4

reactor building was confirmed. At approximately 11:00 am, TEPCO employees confirmed that the fire was out.
- At approximately 5:45 am on March 16th, a TEPCO employee discovered a fire at the northwest corner of the Nuclear Reactor Building. TEPCO immediately reported this incident to the fire department and the local government and proceeded with the extinction of fire. At approximately 6:15 am, TEPCO staff confirmed at the site that there are no signs of fire.
- At approximately 8:21 am on March 20th, spraying water by fire engines was started with the cooperation of Self-Defense Forces and they finished the operation at approximately 9:40 am. At approximately 6:45 pm spraying water was started by Self-Defenses' water cannon trucks and finished at approximately 7:45 pm.
- At approximately 6:30 am, March 21st, spraying water by fire engines was started with the cooperation of Self-Defense Forces and the United States Armed Forces. At approximately 8:40 am, March 21, they had finished the operation.
- On March 21st, cabling has been completed from temporary substation to the main power center.
- From approximately 5:20 pm on March 22nd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 8:30 pm on the same day.
- From approximately 10:00 am on March 23rd, spraying water from the concrete pumping vehicle was conducted and ended at approximately 1:00 pm on the same day.
- From approximately 2:35 pm on March 24th, spraying water by the concrete pumping vehicle was conducted and ended at approximately 5:30 pm on the same day.
- From 6:05 am on March 25th, seawater injection through Fuel Pool Cooling and Filtering System was initiated and finished at approximately 10:20 am on the same day.
- From 7:05 pm on March 25th, water spray by the concrete pumping vehicle was started and finished at 10:07 pm on March 25th.
- From 4:55 pm on March 27th, water spray by the concrete pumping vehicle was started and finished at 7:25 pm on March 27th.

*Unit 5 and 6
- At 5 am on March 19th, we started the Residual Heat Removal System Pump (C) of Unit 5 in order to cool the spent fuel pool. At 10:14 pm, we started the Residual Heat Removal System Pump (B) of Unit 6 in order to cool the spent fuel pool.
- Unit 5 has been in reactor cold shutdown since 2:30 pm on March 20th. Unit 6 has been in reactor cold shutdown since 7:27 pm on March 20th.
- At Units 5 and 6, in order to prevent hydrogen gas from accumulating within the buildings, we have made three holes on the roof of the reactor building for each unit.
- At approximately 5:24 pm on March 23rd, the temporary Residual Heat Removal System Seawater Pump automatically stopped when its power source was switched. We restarted the pump at around 4:14 pm, March 24th, and resumed cooling of reactor at around 4:35 pm.

*On March 18th, regarding the spent fuel in the common spent fuel pool, we have confirmed that the water level of the pool is secured. At around 10:37 am March 21st, water spraying to common spent fuel pool and finished at 3:30 pm. At around 6:05 pm, fuel pool cooling pump was started to cool the pool.
*common spent fuel pool: a spent fuel pool for common use set in a separate building in a plant site in order to preserve spent fuel which are transferred from the spent fuel pool in each Unit building.

*On March 17th, we patrolled buildings for dry casks and found no signs of abnormal situation for the casks by visual observation. A detailed inspection is under preparation.
*dry cask: a measure to store spent fuel in a dry storage casks in storages. Fukushima Daiichi Nuclear Power Station started to utilize the measure from August 1995.

In total 13 fire engines are lent for spraying water to the spent fuel pools and water injection to the nuclear reactors by various regional fire departments as well as Tokyo Fire Department. Also, instruction regarding the setting and operation of large scale decontamination system was provided.

*On March 24, 2011, it was confirmed that 3 workers from cooperative companies who were in charge of cable laying work in the 1st floor and the underground floor of turbine building were exposed to the radiation dose of more than 170mSv. 2 of them were confirmed that their leg skins were contaminated. Although they were decontaminated by laundering, they were transferred to Fukushima Medical University hospital because there is possibility that they get a burn injury by beta ray. On March 25th, remaining worker was also transferred to Fukushima Medical University hospital. After that, all 3 workers arrived at National Institute of Radiological Sciences in Chiba Prefecture. The 3 workers were discharged from the institute on March 23rd. We will assess radiation dose of 2 worker's skin on their legs by beta ray. We thoroughly instruct our employees and workers of cooperative companies to recognize APD alarm and evacuate when the alarm rings. We will explain this event, together with

appropriate measures to be taken, to the government and to people concerned in order to fully secure the safety in relation to radiation dose management and operations associated with radiation exposure.

*On March 21st, 23rd to 26th, we detected technetium, cobalt, iodine, cesium, tellurium, barium, lanthanum and molybdenum from the seawater around discharge canal of Unit 1, 2, 3 and 4.

*On March 20th, 21st, 23rd to 26th, we detected iodine, cesium, tellurium and ruthenium in the air collected at the site of Fukushima Daiichi Nuclear Power Station.

*On March 28th, we detected radioactive materials contained in the puddles found in the turbine building of Unit 1 to 4.

*At approximately 3:30 pm, March 27th, we found water pooling in the vertical shaft of the trench outside of the turbine buildings for Units 1 to 3. The radiation dose at the surface of the water amounted 0.4 mSv/h in Unit 1 and over 1,000 mSv/h in Unit 2. We could not confirm the amount of the radiation dose in Unit 3. We will keep observing the condition of the water in the vertical shaft.

*We will continuously endeavor to securing safety, and monitoring of the surrounding environment.

Fukushima Daini Nuclear Power Station:
Units 1 to 4: shutdown due to earthquake
*The national government has instructed evacuation for those local residents within 10km radius of the periphery.

*In order to achieve cold shutdown, reactor cooling function was restored and cooling of reactors was conducted. As a result, all reactors achieved cold shutdown: Unit 1 at 5:00 pm, March 14th, Unit 2 at 6:00 pm, March 14th, Unit 3 at 0:15 pm, March 12th, Unit 4 at 7:15 am, March 16th.

*Since March 12th, we had been preparing measures for reducing the pressure of reactor containment vessels (partial discharge of air containing radioactive materials to outside), but on March 17th, we stopped such preparation in all Units.

*(Unit 1)
As it is confirmed that the temperature of the Emergency Equipment Cooling Water System *1 has increased, at 3:20 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 4:25 pm, March 15th, after replacing the power facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

*(Unit 4)
As it is confirmed that the pressure at the outlet of the pumps of the Emergency Equipment Cooling Water System*1 has been decreased, at 8:05 pm, March 15th, we stopped the Residual Heat Removal System (B) for the inspection. Subsequently, failure was detected in the power supply facility associated with the pumps of the Emergency Equipment Cooling Water System. At 9:25 pm, March 15th, after replacing the relevant facility, the pumps and the Residual Heat Removal System (B) have been reactivated.

*1:emergency water system in which cooling water (pure water) circulates which exchanged the heat with sea water in order to cool down bearing pumps and/or heat exchangers etc.

Kashiwazaki Kariwa Nuclear Power Station:
Units 1, 5, 6, 7: normal operation
(Units 2 to 4: outage due to regular inspection)

[Thermal Power Station]
- Hirono Thermal Power Station Units 2 and 4: shutdown due to earthquake
- Hitachinaka Thermal Power Station Unit 1: shutdown due to earthquake
- Kashima Thermal Power Station Units 2, 3, 5, 6: shutdown due to earthquake

[Hydro Power Station]
- All the stations have been restored.
  (Facilities damaged by the earthquake are now being repaired in a timely manner.)

[Transmission System, etc.]
- All substation failed due to the earthquake have been restored.
  (Facilities damaged by the earthquake are now being repaired in a timely manner.)

[Blackout in TEPCO's Service Area]
- All the blackouts are resolved.

[Supply and Demand Status within TEPCO's Service Area to Secure Stable Power Supply]
- Considering the critical balance of our power supply capacity and

expected power demand forward, in order to avoid unexpected blackout, TEPCO has been implementing rolling blackout (planned blackout alternates from one area to another) since Mar 14th. We will make our utmost to secure the stable power supply as early as possible. For customers who will be subject to rolling blackout, please be prepared for the announced blackout periods. Also for customers who are not subject to blackouts, TEPCO appreciates your continuous cooperation in reducing electricity usage by avoiding using unnecessary lighting and electrical equipment.

[Others]

- Please do NOT touch cut-off electric wires.
- In order to prevent fire, please make sure to switch off the electric appliances such as hair driers when you leave your house.
- For the customer who has in-house power generation, please secure fuel for generator.

back to page top

From: Emche, Danielle
Sent: Monday, March 28, 2011 3:53 AM
To: LIA02 Hoc; LIA03 Hoc
Subject: Next wave of arrivals and departures

Can you send me updated tables of existing team members departing, new team members arriving and planned future team members in the next 15 to 20 minutes?
Danielle
Sent from an NRC BlackBerry.

000/173

From: Taylor, Robert
Sent: Tuesday, March 29, 2011 5:34 AM
To: RST01 Hoc
Cc: Scott, Michael
Subject: Calculation on Unit 4 SFP

Follow Up Flag: Follow up
Flag Status: Flagged

RST,

We understand GE has done a "calculation" regarding the Unit 4 SFP based on first hand observations based on eye-witness accounts from individuals who were on the refueling floor when the earthquake struck. It apparently also includes assumptions regarding other ignition sources in the area (aka acetylene) that could have exacerbated the hydrogen explosion. Can we ask GE for a copy of the calculation? This could help us understand the timeline from earthquake to explosion. Any first-hand knowledge and insights would greatly enhance our understanding and interactions with the Japanese.

Please let me know if you have any questions.

Regards,
Rob

qqq/174

From: Karas, Rebecca
Sent: Monday, March 28, 2011 1:27 PM
To: Stone, Rebecca; Ralph, Melissa; Fiske, Jonathan
Subject: FW: Correction: FOIA information request

Did final guidance on this ever come out (this is the last email I have). When is the due date for forwarding all emails?

Rebecca Karas, Chief
Geosciences and Geotechnical Engineering Branch 1
Division of Site and Environmental Reviews
Office of New Reactors
U.S. Nuclear Regulatory Commission
Phone: 301-415-7533
Fax: 301-415-5397

From: OST01 HOC
Sent: Saturday, March 19, 2011 3:25 PM
To: Abrams, Charlotte; Adams, John; Afshar-Tous, Mugeh; Alemu, Bezakulu; Alter, Peter; Anderson, James; Ashkeboussi, Nima; Baker, Stephen; Bergman, Thomas; Berry, Rollie; Bloom, Steven; Blount, Tom; Boger, Bruce; Bower, Anthony; Brandon, Lou; Brandt, Philip; Brock, Kathryn; Brown, Cris; Brown, David; Brown, Eva; Brown, Frederick; Bukharin, Oleg; Camper, Larry; Carpenter, Cynthia; Case, Michael; Casto, Greg; Cervera, Margaret; Chazell, Russell; Chen, Yen-Ju; Chokshi, Nilesh; Chowdhury, Prosanta; Circle, Jeff; Clement, Richard; Clinton, Rebecca; Collins, Frank; Cool, Donald; Costa, Arlon; Crutchley, Mary Glenn; Cruz, Zahira; Dacus, Eugene; DeCicco, Joseph; Decker, David; Dembek, Stephen; Devlin, Stephanie; Doane, Margaret; Dorman, Dan; Dozier, Jerry; Droggitis, Spiros; Dudek, Michael; Dudes, Laura; Emche, Danielle; English, Lance; Erlanger, Craig; Esmaili, Hossein; Figueroa, Roberto; Fiske, Jonathan; Franovich, Rani; Fuller, Edward; Galletta, Thomas; Gambone, Kimberly; Giitter, Joseph; Gordon, Dennis; Gott, William; Grant, Jeffery; Grobe, Jack; Hale, Jerry; Hardesty, Duane; Hart, Ken; Hart, Michelle; Hasselberg, Rick; Henderson, Karen; Hiland, Patrick; Holahan, Patricia; Holahan, Vincent; Holian, Brian; Huyck, Doug; Howard, Tabitha; Huffert, Anthony; Hurd, Sapna; Isom, James; Jackson, Karen; Jessie, Janelle; Johnson, Michael; Jolicoeur, John; Jones, Andrea; Jones, Cynthia; Kahler, Carolyn; Kammerer, Annie; Karas, Rebecca; Khan, Omar; Kowalczik, Jeffrey; Kozal, Jason; Kratchman, Jessica; Kugler, Andrew; Lamb, Christopher; Larson, Emily; LaVie, Steve; Lewis, Robert; Li, Yong; Lombard, Mark; Lubinski, John; Lynch, Jeffery; Mamish, Nader; Manahan, Michelle; Marksberry, Don; Marshall, Jane; Mayros, Lauren; Mazaika, Michael; McConnell, Keith; McCoppin, Michael; McDermott, Brian; McGinty, Tim; McMurtray, Anthony; Merritt, Christina; Meyer, Karen; Miller, Charles; Miller, Chris; Milligan, Patricia; Mohseni, Aby; Moore, Scott; Morlang, Gary; Morris, Scott; Mroz (Sahm), Sara; Munson, Clifford; Murray, Charles; Nerret, Amanda; Norris, Michael; Norton, Charles; Ordaz, Vonna; Padovan, Mark; Patel, Jay; Parillo, John; Pope, Tia; Purdy, Gary; Quinlan, Kevin; Ragland, Robert; Ralph, Melissa; Reed, Elizabeth; Reed, Wendy; Reis, Terrence; Riley (OCA), Timothy; Rini, Brett; Rodriguez-Luccioni, Hector; Rosenberg, Stacey; Ross-Lee, MaryJane; Roundtree, Amy; Ruland, William; Salay, Michael; Salus, Amy; Sanfilippo, Nathan; Scarbrough, Thomas; Schaperow, Jason; Schmidt, Duane; Schoenebeck, Greg; Schrader, Eric; Schwartzman, Jennifer; Seber, Dogan; Shane, Raeann; Shea, James; Shepherd, Jill; Sheron, Brian; Skeen, David; Sloan, Scott; Smiroldo, Elizabeth; Smith, Theodore; Stahl, Eric; Stang, Annette; Steger (Tucci), Christine; Stieve, Alice; Stone, Rebecca; Stransky, Robert; Sturz, Fritz; Sullivan, Randy; Sun, Casper; Tappert, John; Temple, Jeffrey; Thaggard, Mark; Thomas, Eric; Thorp, John; Tobin, Jennifer; Trefethen, Jean; Tschiltz, Michael; Turtil, Richard; Uhle, Jennifer; Valencia, Sandra; Vaughn, James; Vick, Lawrence; Wastler, Sandra; Watson, Bruce; Weber, Michael; Webber, Robert; White, Bernard; Wiggins, Jim; Williams, Donna; Williams, Joseph; Williamson, Linda; Willis, Dori; Wimbush, Andrea; Wittick, Brian; Wray, John; Wright, Lisa (Gibney); Wright, Ned; Wunder, George; Young, Francis; Zimmerman, Roy
Subject: Correction: FOIA information request

Good Afternoon All,

000175

The staff of the NRC HOC has received a broad scope FOIA request from the Associated Press requiring the release of all communications pertaining to the Japanese nuclear incidents caused by the March 11, 2011, earthquake and tsunami.

In response to this request, an email account is being created as a FOIA drop box. In the near future, you will be required to forward all emails that you have received (either to your personal email or HOC computer email) relating to these events to the established drop box. This includes emails that you have deleted but have the ability to restore. In addition, all future emails pertaining to the Japanese nuclear incidents MUST be copied to this drop box. The address is FOIA Response.hoc Resource@nrc.gov or FoiaResponse.hoc@nrc.gov.

A team is currently being assembled to ensure that all forwarded communications will be reviewed, and any information that qualifies for exemption (including P.I.I.) will be redacted. Therefore, you do not need to filter or redact any communication that is to be forwarded for compliance with this FOIA request.

This request has been granted expedited processing. It requires timely action from each of us to comply within the time constraints.

If you have any questions or concerns, please contact Rebecca Stone, Melissa Ralph, or Jonathan Fiske.

From: RST01 Hoc
Sent: Monday, March 28, 2011 11:39 PM
To: ET07 Hoc
Subject: RE: Unit 4 defueling

Approximately November 25-26, 2010.

RST Coordinator

From: ET07 Hoc
Sent: Monday, March 28, 2011 4:49 PM
To: RST01 Hoc
Subject: Unit 4 defueling

Mike Weber would like to know the date Unit 4 was defueled.

QQQ/176

March 29, 2011
Nuclear and Industrial Safety Agency

Seismic Damage Information (the 61st Release)
(As of 15:00 March 29th, 2011)

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

Major updates are as follows.

1. Nuclear Power Stations (NPSs)

● Fukushima Dai-ichi NPS

- The pump for the fresh water injection to RPV of Unit 1 was switched from the Fire Pump Truck to the temporary motor-driven pump.(08:32 March 29th)
- Water spray (fresh water) for Unit 3 using Concrete Pump Truck (50t/h) was started. (14:17 March 29th)
- Lighting of Central Operation Room of Unit 4 was recovered (11:50 March 29th)
- When removing the flange of pipes of Residual Heat Removal Seawater System outside the building of Unit 3, three subcontractor's employees were wetted by the water remaining in the pipe. However, as the result of wiping the water off, no radioactive materials were attached to their bodies.

2. Action taken by NISA

- On March 28th, Chief Cabinet Secretary mentioned the continuation of the limited-access within the area of 20 km from Fukushima Dai-ichi NPS. On the same day, the Local Emergency Response Headquarters notified the related municipalities of forbidding entry to the evacuation area within the 20 km zone.
- The report was received, regarding the accident and trouble etc. in Onagawa NPS of Tohoku Electric Power Co. Inc. (the trouble of pump of component cooling water system etc. in Unit 2 and the fall of heavy oil

QQQ/177

tank for auxiliary boiler of Unit 1 by tsunami), pursuant to the Article 62-3 of the Nuclear Regulation Act and the Article 3 of the Ministerial Ordinance for the Report Related to Electricity. (11:16 March 29th)

(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 29th)

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Reactor Pressure*1 [MPa]	0.484(A) 0.592(B)	0.076(A) 0.074(B)	0.130(A) 0.006(C)	—	0.111	0.109
CV Pressure (D/W) [kPa]	275	100	107.5	—	—	—
Reactor Water Level*2 [mm]	-1,650(A) -1,650(B)	-1,500(A) Not available(B)	-1,850(A) -2,250(B)	—	2,333	1,904
Suppression Pool Water Temperature (S/C) [℃]	—	—	—	—	—	—
Suppression Pool Pressure (S/C) [kPa]	275	down scale (under survey)	179.6	—	—	—
Spent Fuel Pool Water Temperature [℃]	Indicator Failure	46	Indicator Failure	Indicator Failure	38.8	21.0
Time of Measurement	09:40 March 29th	10:00 March 29th	12:00 March 29h	March 29th	12:00 March 29th	12:00 March 29th

*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 Reactor Core was increased by utilizing the Feedwater Line in addition to the Fire Extinguish Line. ($2m^3/h \rightarrow 18m^3/h$).(02:33 March 23rd) Later, it was switched to the Feedwater Line only (around $11m^3/h$). (09:00 March 23rd)
- Lighting in the Central Operation Room was recovered. (11:30 March 24th)
- As the result of concentration measurement in the stagnant water on the basement floor of the turbine building, $2.1 \times 10^5 Bq/cm^3$ of ^{131}I (Iodine) and $1.8 \times 10^6 Bq/cm^3$ of ^{137}Cs (Caesium) were detected as major radioactive nuclides. The stagnant water has been transferring to the Condenser. (since around 17:00 March 24)
- White smoke was confirmed to generate continuously. (As of 06:30 March 29th)
- The pump for the fresh water injection to RPV of Unit 1 was switched from the Fire Pump Truck to the temporary motor-driven pump. (08:32 March 29th.)
- Fresh water injection to RPV is being carried out. (As of 15:00 March 29th)

<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 Pool (Suppression Chamber) decreased (06:10 March 15th), there was a possibility that an incident occurred in the Chamber. (About 06:20 March 15th)
- Electric power receiving at the emergency power source transformer from the external transmission line was completed. The work for laying the electric cable from the facility to the load side was carried out. (As of 13:30 March 19th)
- Injection of 40t of Seawater to the Spent Fuel Pool was started.(from 15:05 till 17:20 March 20th)
- Power Center of Unit 2 received electricity (15:46 March 20th)
- White smoke generated. (18:22 March 21st)
- White smoke was died down and almost invisible. (As of 07:11 March 22nd)
- 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)
- White smoke was confirmed to generate continuously (As of 08:00 March 26th)
- Lighting of Central Operation Room was recovered (16:46 March26th)
- The pump for the fresh water injection to RPV of Unit 2 was switched

from the Fire Pump Truck to the temporary motor-driven pump.(18:31 March 27th)

- Regarding the result of the concentration measurement in the stagnant water on the basement floor of the turbine building of Unit 2 of Fukushima Dai-ichi NPS announced by TEPCO on 27 March, TEPCO reported to NISA that as the result of analysis and evaluation through re-sampling, judging the measured value of Iodine-134 was wrong, the concentrations of gamma nuclides including Iodine-134 were less than the detection limit.(00:07 March 28)
- White smoke was confirmed to generate continuously. (As of 06:30 March 29th)
- Fresh water injection to RPV is being carried out. (As of 15:00 March 29th)

<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 (08:41 March 13th)
- Fresh water started to be injected to RPV via the Fire Extinguish Line. (11:55 March 13th)
- Seawater started to be injected to RPV via the Fire Extinguish Line. (13:12 March 13th)
- Seawater injection for Units 1 and 3 was interrupted due to the lack of seawater in pit. (01:10 March 14th)
- Seawater injection to RPV for Unit 3 was restarted. (03:20 March 14th)
- Operation of Vent (05:20 March 14th)
- The pressure in Primary Containment Vessel (PCV) of Unit 3 rose unusually. (07:44 March 14th) TEPCO reported to NISA on the event falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. (7:52 March 14th)
- In Unit 3, the explosion like Unit 1 occurred around the reactor building (11:01 March 14th)
- The white smoke like steam generated from Unit 3. (08:30 March 16th)

- Because of the possibility that PCV of Unit 3 was damaged, the workers evacuated from the main control room of Units 3 and 4 (common control room). (10:45 March 16th) Thereafter the operators returned to the room and restarted the operation of water injection. (11:30 March 16th)
- Seawater was discharged 4 times to Unit 3 by the helicopters of the Self-Defence Force. (9:48, 9:52, 9:58 and 10:01 March 17th)
- The riot police arrived at the site for the water spray from the grand. (16:10 March 17th)
- The Self-Defence Force started the water spray using a fire engine. (19:35 March 17th)
- The water spray from the ground was carried out by the riot police. (From 19:05 till 19:13 March 17th)
- The water spray from the ground was carried out by the Self-Defense Force using 5 fire engines. (19:35, 19:45, 19:53, 20:00 and 20:07 March 17th)
- The water spray from the ground using 6 fire engines (6 tons of water spray per engine) was carried out by the Self-Defence Force. (From before 14:00 till 14:38 March 18th)
- The water spray from the ground using a fire engine provided by the US Military was carried out. (Finished at 14:45 March 18th)
- Hyper Rescue Unit of Tokyo Fire Department carried out the water spray. (Finished at 03:40 March 20th)
- The pressure in PCV of Unit 3 rose (320 kPa 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)
- As the results of the survey of the stagnant water, into which workers who were laying electric cable on the ground floor and the basement floor of the turbine building of the Unit 3 walked, the dose rate on the water surface was around 400mSv/h, and as the result of gamma-ray analysis of the sampling water, the totaled concentration of each nuclide of the sampling water was around 3.9×10^{6} Bq/cm^{3}.
- Water spray by Kawasaki City Fire Bureau supported by Tokyo Fire Department was carried out. (From 13:28 till 16:00 March 25th)
- Water spray of approximately 100t using Concrete Pump Truck (50t/h) was carried out. (From 12:34 till 14:36 March 27th)
- The pump for the fresh water injection to RPV was switched from the Fire Pump Truck to the temporary motor-driven pump.(20:30 March 28th)
- White smoke was confirmed to generate continuously (As of 06:30 March 29th)
- Water spray (fresh water) for Unit 3 using Concrete Pump Truck (50t/h) was started. (14:17 March 29th)
- Injection of fresh water to RPV is being carried out. (As of 15:00 March 29th)

<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-Defense Force was started. (From around 18:30 till 19:46 March 20th).
- Water spray over the Spent Fuel Pool by Self-Defence Force using 13 fire engines was started (From 06:37 till 08:41 March 21st).
- Works for laying electricity cable to the Power Center was completed. (At around 15:00 March 21st)
- Power Center received electricity. (10:35 March 22nd)
- Spray of around 150t of water using Concrete Pump Truck (50t/h) was carried out. (from 17:17 till 20:32 March 22nd)
- Spray of around 130t of water using Concrete Pump Truck (50t/h) was carried out. (From 10:00 till 13:02 March 23rd)
- Spray of around 150t of water using Concrete Pump Truck (50t/h) was carried out. (From 14:36 till 17:30 March 24th)
- Spray of around 150t of water using Concrete Pump Truck (50t/h) was carried out. (From 19:05 till 22:07 March 25th)
- Injection of seawater to the Spent Fuel Pool via the Fuel Pool Cooling Line was carried out. (From 06:05 till 10:20 March 25th)
- Water spray of approximately 125t using Concrete Pump Truck (50t/h) was carried out. (From 16:55 till 19:25 March 28th)
- White smoke was confirmed to generate continuously. (As of 06:00 March 29th)
- Lighting of Central Operation Room was recovered. (11:50 March 29th)

<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 almost full at after 06:00 March 18th.
- Water spray over the Common Spent Fuel Pool was started (From 10:37 till 15:30 March 21st)
- The power was started to be supplied (15:37 March 24th) and cooling was also started.(18:05 March 24th)
- As of 16:10 March 28th, water temperature of the pool was around 35℃.

<Other>

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

  (As the result of measurement on 27 March, it was detected as 250 times higher than the limit in water. On the other hand, as the result of the analysis at the north side of the Water Discharge Canal of the NPS, 4.6×10^{1}Bq/cm^3 of ^{131}I (Iodine) (1,150 times higher than the limit) was detected. (14:05 March 27th)
- The water was confirmed to be collected in the vertical parts of the trenches (an underground structure for laying pipes, shaped like a tunnel) outside of the turbine building of Units 1 to 3. The dose rates on the water surface were 0.4 mSv/h of the Unit 1's trench and 1,000 mSv/h of the Unit 2's trench. The rate of the Unit 3's trench could not measure because of the rubble. (Around 15:30 March 27th)
- In the samples of soil collected on 21 and 22 March 2011 on the site (at 5 points) of Fukushima Dai-ichi NPS, plutonium 238, 239 and 240 were detected (23:45 March 28th announced by TEPCO). The concentration of the detected plutonium was at the equivalent level of the fallout (radioactive fallout) that was observed in Japan concerning the past atmospheric nuclear testing, i.e. at the equivalent level of the normal condition of environment, and was not at the level of having harmful influence on human body.
- When removing the flange of pipes of Residual Heat Removal Seawater System outside the building of Unit 3, three subcontractor's employees were wetted by the water remaining in the pipe. However, as the result of wiping the water off, no radioactive materials were attached to their bodies. (12:03 March 29th)

● 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 29th)

	Unit	Unit 1	Unit 2	Unit 3	Unit 4
Reactor Pressure*1	MPa	0.15	0.13	0.10	0.11
Reactor water temperature	℃	27.2	27.7	39.2	34.0
Reactor water level*2	mm	9,296	10,296	7,823	8,036
Suppression pool water temperature	℃	24	25	26	26
Suppression pool pressure	kPa (abs)	107	106	103	102
Remarks		cold shutdown	cold shutdown	cold shutdown	cold shutdown

*1: Converted from reading value to absolute pressure

*2: Distance from the top of fuel

(3) Report concerning other incidents

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

functions) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 2. (5:32 March 12th)

- TEPCO reported to NISA the event (Loss of pressure suppression function) falling under the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Unit 4 of Fukushima Dai-ni NPS. (6:07 March 12th)

● Onagawa NPS (Tohoku Electric Power Co. Inc.)
(Onagawa Town, Oga County and Ishinomaki City, Miyagi Prefecture)

(1) The state of operation

Unit 1 (524MWe): automatic shutdown, cold shut down at 0:58, March 12th
Unit 2 (825MWe): automatic shutdown, cold shut down at earthquake
Unit 3 (825MWe): automatic shutdown, cold shut down at 1:17, March 12th

(2) Readings of monitoring post, etc.

MP2 (Monitoring at the North End of Site Boundary)
approx. 0.77 μ SV/h (16:00 March 27th) → approx. 0.68 μ SV/h (16:00 March 28th)

(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.

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.

(March 28th)

Regarding the mistake in the evaluation of the concentration measurement in the stagnant water on the basement floor of the turbine building of Unit 2 of Fukushima Dai-ichi NPS announced by TEPCO on 27 March, NISA directed TEPCO orally to prevent the recurrence of such a mistake.

13:50 Receiving the suggestion by the special meeting of Nuclear Safety Commission (Stagnant water on the underground floor of the turbine building at Fukushima Dai-ichi Plant Unit 2), NISA directed TEPCO orally to add the sea water monitoring points and carry out the groundwater monitoring.

Regarding the delay in the reporting of the water confirmed outside of the turbine buildings, NISA directed TEPCO to accomplish the communication in the company on significant information in a timely manner and to report it in a timely and appropriate manner.

(March 29th)

11:16 The report was received, regarding the accident and trouble etc. in Onagawa NPS of Tohoku Electric Power Co. Inc. (the trouble of pump of component cooling water system etc. in Unit 2 and the fall of heavy oil tank for auxiliary boiler of Unit 1 by tsunami), pursuant to the Article 62-3 of the Nuclear Regulation Act and the Article 3 of the Ministerial Ordinance for the Reports related to Electricity.

< Possibility on radiation exposure (As of 15:00 March 29th) >

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.

(6) Fukushima Prefecture has started the screening from 13 March. It is carried out by rotating the evacuation sites and at the 13 places (set up permanently) such as health offices. Up until March 27th, the screening was done to 98,944 people. Among them, 99 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. Exposure of workers

As for the workers conducting operations in Fukushima Dai-ichi NPS, the total number of people who were at the level of exposure more than 100mSv becomes 19, as the 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 on March 24.

For two out of the three workers, the attachment of radioactive material on the skin of both legs was confirmed. As the two workers were judged to have a possibility of beta ray burn, they were transferred to the Fukushima Medical University Hospital, and after that, on March 25th, all of the three workers arrived at the National Institute of Radiological Sciences in the Chiba Prefecture. As the result of examination, the level of exposure of their legs was estimated to be from 2 to 3 Sv. The level of exposure of both legs and internal did not require medical treatment, but they decided to monitor the progress of all three workers in the hospital. All the three workers have been discharged from the hospital around the noon on 28 March.

3. Others

(1) 4 members of Self-Defence Force who worked in Fukushima Dai-ichi NPS were injured by explosion. One member was transferred to National Institute of Radiological Sciences. After the examination, judged that there were wounds but no risk for health from the exposure, the one was

released from the hospital on March 17th. No other exposure of the Self-Defence Force member was confirmed at the Ministry of Defence.

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

(3) On March 24th, examinations of thyroid gland for 66 children aged from 1 to 15 years old were carried out at the Kawamata Town public health Center. The result was at not at the level of having harmful influence.

(4) From March 26th to 27th, examinations of thyroid gland for 137 children aged from 1 to 15 years old were carried out at the Iwaki City Public Health Center. The result was not at the level of having harmful influence.

<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.

(3) On March 28th, Chief Cabinet Secretary mentioned the continuation of the limited-access within the area of 20 km from Fukushima Dai-ichi NPS. On the same day, the Local Emergency Response Headquarters notified the related municipalities of forbidding entry to the evacuation area within the 20 km zone.

<Situation of the injured (As of 08:00 March 29th)>

1. Injury due to earthquake on 11 March
   - Two employees (slightly, have already gone back working)
   - Two subcontract employees (one fracture in both legs, be in hospital)
   - Two missing (TEPCO's employee, missing in the turbine building of Unit 4)

2. Injury due to the explosion of Unit 1 of Fukushima Dai-ichi NPS on 12 March
   - Four employees (two TEPCO's employees and two subcontractor's employees) were injured at the explosion and smoke of Unit 1 around turbine building (non-controlled area of radiation) and were examined by Kawauchi Clinic. Two TEPCO's employees return to work again and two subcontractors' employees are under home treatment.

3. Injury due to the explosion of Unit 3 of Fukushima Dai-ichi NPS on 14 March.
   - Four TEPCO's employees (They have already return to work.)
   - Three subcontractor employees (They have already return to work.)
   - Four members of Self-Defence Force (one of them was transported to National Institute of Radiological Sciences considering internal possible exposure. The examination resulted in no internal exposure. The member was discharged from the institute on March 17th.)

4. Other injuries

- Tow subcontractor's employees were injured during working at temporary control panel of power source in the Common Spent Fuel Pool, transported to where were industrial medical doctors the Fukushima Dai-ni NPS on 22 and 23 March. (One employee has already returned to work and the other is under home treatment.)
- One emergency patient on 12 March. (cerebral infarction, transported by the ambulance, be in hospital)
- Ambulance was requested for one employee complaining the pain at left chest outside of control area on March 12. (conscious, under home treatment)
- Two employees complaining discomfort wearing full-face mask in the main control room were transported to Fukushima Dai-ni NPS for a consultation with an industrial doctor on 13 March. (One employee has already returned to work and the other is under home treatment.)

<Situation of resident evacuation (As of 15:00 March 29th)>

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.

<Directives regarding foods and drinks>

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

(1) Items under the suspension of shipment and restriction of intake (As of March 29th)

Prefectures	Suspension of shipment	Restriction of intake
Fukushima Prefecture	Non-head type leafy vegetables, head type leafy vegetables , flowerhead brassicas (Spinach, Cabbage, Broccoli, Cauliflower, *Komatsuna*, Kukitachina*, Shinobufuyuna**, Rape, *Chijirena, Santouna*, Kousaitai*, Kakina*, etc.*), Turnip, Raw milk	Non-head type leafy vegetables, head type leafy vegetables , flowerhead brassicas (Spinach, Cabbage, Broccoli, Cauliflower, *Komatsuna*, Kukitachina*, Shinobufuyuna,* Rape, *Chijirena, Santouna*, Kousaitai*, Kakina*, etc.*)
Ibaraki Pref.	Spinach, *Kakina**, Parsley, Raw milk	
Tochigi Pref.	Spinach, *Kakina**	
Gunma Pref.	Spinach, *Kakina**	

*a green vegetable

(2) Request for restriction of drinking for tap-water (As of 15:00 March 29th)

Scope under restriction	Water service (Local governments requested for restriction)
All residents	Iitate small water service (Iitate Village, Fukushima Prefecture)
Babies ・Water services that continue to respond to the directive ・Tap-water supply service	<Fukushima Prefecture> Minami-soma City water service (Minami-soma City) Iwaki City water supply service (Iwaki City) Date City Tuskidate small water supply service (Date City) Non

that continues to respond to the directive	

<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

東京電力(株)公表資料

３月３０日（水）１０時３０分予定

別紙

福島第一原子力発電所１号機トレンチ内の溜まり水の測定結果について

核種	試料濃度(Bq/cm^3)
Nb-95 (約35日)	約4.7×10^{-2}
Tc-99m (約6時間)	約2.0×10^{-1}
Ru-106 (約370日)	約4.3×10^{-1}
Ag-110m (約250日)	約3.6×10^{-2}
Te-129 (約70分)	約2.1×10^{1}
Te-129m (約34日)	約4.1×10^{0}
I-131 (約8日)	約5.4×10^{0}
I-132 (約2時間)	約1.8×10^{0}
Te-132 (約3日)	約1.8×10^{0}
Cs-134 (約2年)	約7.0×10^{-1}
Cs-136 (約13日)	約5.1×10^{-2}
Cs-137 (約30年)	約7.9×10^{-1}
La-140 (約2日)	約8.1×10^{-2}

From: LIA02 Hoc
Sent: Tuesday, March 29, 2011 2:33 PM
To: Reyes, Debra
Cc: LIA03 Hoc
Subject: RE: Op Center - Laptop

Great, we will watch for it.

From: Reyes, Debra
Sent: Tuesday, March 29, 2011 2:31 PM
To: LIA02 Hoc
Subject: RE: Op Center - Laptop

You are welcome. I will be sending an updated list with laptop asset numbers soon.

From: LIA02 Hoc
Sent: Tuesday, March 29, 2011 2:30 PM
To: Reyes, Debra; ET02 Hoc; LIA03 Hoc
Cc: Turner, Joseph; Sullivan, Allen; Brusoe, Eric; Heard, Robert; Hincke, John; Bissett, Ryan
Subject: RE: Op Center - Laptop

I will forward to the team in Japan and instruct Danielle Emche to contact CSC with any questions regarding the attached instructions.

Thanks,

LIA02 (Jill Shepherd)

From: Reyes, Debra
Sent: Tuesday, March 29, 2011 2:27 PM
To: ET02 Hoc; LIA02 Hoc; LIA03 Hoc
Cc: Turner, Joseph; Sullivan, Allen; Brusoe, Eric; Heard, Robert; Hincke, John; Bissett, Ryan; Reyes, Debra
Subject: Op Center - Laptop

Good afternoon,

The attached list of OIS provided international laptops has been updated. The first five of the eleven on this list have not been configured with the generic encryption software password that is requested upon initial power on. The remaining six have been configured with the generic password, so that any user can login with the generic user id and password (instructions are attached). However, to login into Citrix you will need to login using your NRC user id and password (which authenticates users to the secure NRC network).

Please note that the generic login will not work on laptops provided by the Regions or Program Offices. All future international laptops issued by OIS will be configured with the generic login, so that the

Also attached are instructions for importing Citrix certificates and the mobile broadband card user guide:

(1) Japan Project Loaner Laptop Guide User Reference Guide
(2) How to Import MPKI (Citrix) Certificates for the Japan Project
(3) Verizon Mobile Broadband Card User Guide for the Japan Project

From: PMT03 Hoc
Sent: Tuesday, March 29, 2011 10:01 PM
To: Hoc, PMT12
Subject: call info

Update on Japanese request for 2000 radiation survey instruments, 2500 dosimeters, protective masks, etc – INPO is coordinating the request and it will be addressed during the industry consortium call on 3/30.

QQQ/179

From: LIA03 Hoc
Sent: Tuesday, March 29, 2011 5:37 AM
To: Doane, Margaret
Cc: LIA03 Hoc
Subject: MDoane report 3-29.doc
Attachments: MDoane report 3-29.doc

Margie:

Attached is Brooke's 'uber-brief' report from this morning. I couldn't get her to say anything more than what I typed.

She sounds like she's in good spirits.

Steve Baker

000180

Monday, March 29 2011
For the morning Chairman brief read-out

The NRC team in Japan has met with the following:

1) BS went to TEPCO meeting this morning. TEPCO provided a detailed report of reactor status (also to PMT). Todd Jackson went to radiation protection @ cabinet level. There is now a working group level meeting.

2) Rad protection issues are progressing.

3) No other news to report, per Brooke.