Extract

April 13, 2011
Nuclear and Industrial Safety Agency

Seismic Damage Information (the 90th Release)
(As of 08:00 April 13th, 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 stagnant water in the trench of the turbine building of Unit 2 was started to be transferred to the Hot Well of the Condenser using a submersible pump. (19:35 April 12th)
  - On the ocean-side of the Inlet Bar Screen of Unit 2, the temporary board to stop water (one of the 7 steel plates) was installed.
  - In order to cool the Spent Fuel Pool of Unit 3, fresh water spray of around 35t using Concrete Pump Truck (50t/h) was carried out. (From 16:26 till 17:16 April 12th)
  - In order to cool the Spent Fuel Pool of Unit 4, fresh water spray of around 195t using Concrete Pump Truck (50t/h) was carried out. (From 00:30 till 06:57 April 13th)

News Release

Extract

経済産業省
Ministry of Economy, Trade and Industry

April 13, 2011
Nuclear and Industrial Safety Agency

Seismic Damage Information (the 91st Release)
(As of 15:00 April 13th, 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 stagnant water in the trench of the turbine building of Unit 2 was started to be transferred to the Hot Well of the Condenser using a submersible pump. (19:35 April 12th) It was suspended temporarily to check leakage, etc. (11:00 April 13th)
  - Fresh water injection to the Spent Fuel Pool via the Spent Fuel Pool Cooling Line was carried out. (From 13:15 till 14:55 April 13th)
  - As of 08:00 April 13th, water temperature of the Common Spent Fuel Pool was around 29℃.
  - On the ocean-side of the Inlet Bar Screen of Unit 2, the two temporary boards to stop water (3 plates in total) were installed. (Around 08:30 till 10:00 April 13th)
  - The silt fence to prevent the spread of the contaminated water was completed to be installed in front of the Screen of Units 3 and 4. (13:50 April 13th)

< Possibility on radiation exposure of workers>

Around 11:35 April 1st, a worker fell into the sea when he went on board the barge of the US Armed forces in order to adjust the hose. He was rescued immediately by other workers around without any injury and

external contamination. In order to make double sure, measuring by a whole-body counter was carried out, with the result that it was evaluated on 12 April that internal radionuclide contaminant was not exist.

<Directives regarding foods and drinks>

Items under the suspension of shipment and restriction of intake were updated.

For more information:
NISA English Home Page
http://www.nisa.meti.go.jp/english/index.html

Fukushima Dai-ichi Nuclear Power Station Major Parameters of the Plant (As of 7:00, April 13th)

Unit No.	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Situation of water injection	Injecting fresh water via the Water Supply Line. Flow rate of injected water : 6 m^3/h (As of 17:30, April 3rd) temporary measuring instrument	Injecting fresh water via the Fire Extinguish Line. Flow rate of injected water : 7 m^3/h (As of 19:00, April 7th) temporary measuring instrument	Injecting fresh water via the Fire Extinguish Line. Flow rate of injected water: 7 m^3/h (As of 17:32, April 3rd) temporary measuring instrument	Under shutdown	Under shutdown	Under shutdown
Reactor water level	Fuel range A : -1,650mm Fuel range B : -1,650mm (As of 6:00, April 13th)	Fuel range A : -1,500mm (As of 6:00, April 13th)	Fuel range A:-1,850mm Fuel range B:-2,250mm (As of 22:10, April 12th)	#2	Shutdown range measurement 1,586mm (As of 7:00, April 13th)	Shutdown range measurement 2,436mm (As of 7:00, April 13th)
Reactor pressure	0.423MPa g(A) 0.928MPa g(B) #3 (As of 6:00, April 13th)	-0.018MPa g (A) #3 -0.023MPa g (D) #3 (As of 6:00,April 13th)	-0.018MPa g (A) #3 -0.086MPa g (C) #3 (As of 22:10, April 12th)	#2	0.003MPa g (As of 7:00, April 13th)	0.016MPa g (As of 7:00, April 13th)
Reactor water temperature	(Impossible collection due to low system flow rate)			#2	32.9℃ (As of 7:00, April 13th)	48.6℃ (As of 7:00, April 13th)
Reactor Pressure Vessel (RPV) temperature	Feedwater nozzle temperature: 206.2℃ #3 Temperature at the bottom head of RPV: 119.0℃ (As of 6:00, April 13th)	Feedwater nozzle temperature: 170.1℃ Temperature at the bottom head of RPV: 183.2℃ #3 (As of 6:00, April 13th)	Feedwater nozzle temperature: 96.0℃ #3 Temperature at the bottom head of RPV: 119.3℃ (As of 22:10, April 12th)	Unit 4 No heating element (fuel) inside the reactor Unit 5,6 Monitoring by the reactor water temperature		
D/W*1 Pressure, S/C*2 Pressure	D/W: 0.190MPa abs S/C: 0.165MPa abs (As of 6:00, April 13th)	D/W: 0.095MPa abs S/C: #1 (As of 6:00, April 13th)	D/W: 0.1055MPa abs S/C: 0.1685MPa abs (As of 22:10, April 12th)	#2		
CAMS*3	D/W: #1 S/C: 1.04×10^{1}Sv/h (As of 6:00, April 13th)	D/W: 2.79×10^{1}Sv/h S/C: 6.56×10^{-1}Sv/h (As of 6:00,April 13th)	D/W: 1.71×10^{1}Sv/h S/C: 6.61×10^{-1}Sv/h (As of 22:10, April 12th)	#2		
D/W*1 design operating pressure	0.384MPa g(0.485MPa abs)	0.384MPa g(0.485MPa abs)	0.384MPa g(0.485MPa abs)	#2		
D/W*1 maximum operating pressure	0.427MPa g(0.528MPa abs)	0.427MPa g(0.528MPa abs)	0.427MPa g(0.528MPa abs)			
Spent Fuel Pool water	#1	46.0℃ (As of 6:00, April 13th)	#1	#1	35.6℃ (As of 7:00, April 13th)	23.0℃ (As of 7:00, April 13th)
FPC skimmer level	4,500mm (As of 6:00, April 13th)	5,750mm (As of 6:00, April 13th)	#1	4,700mm (As of 22:10, April 12th)	#2	
Power supply	Receiving external power supply (P/C*4 2C)		Receiving external power supply (P/ C*4 4D)		Receiving external power supply	

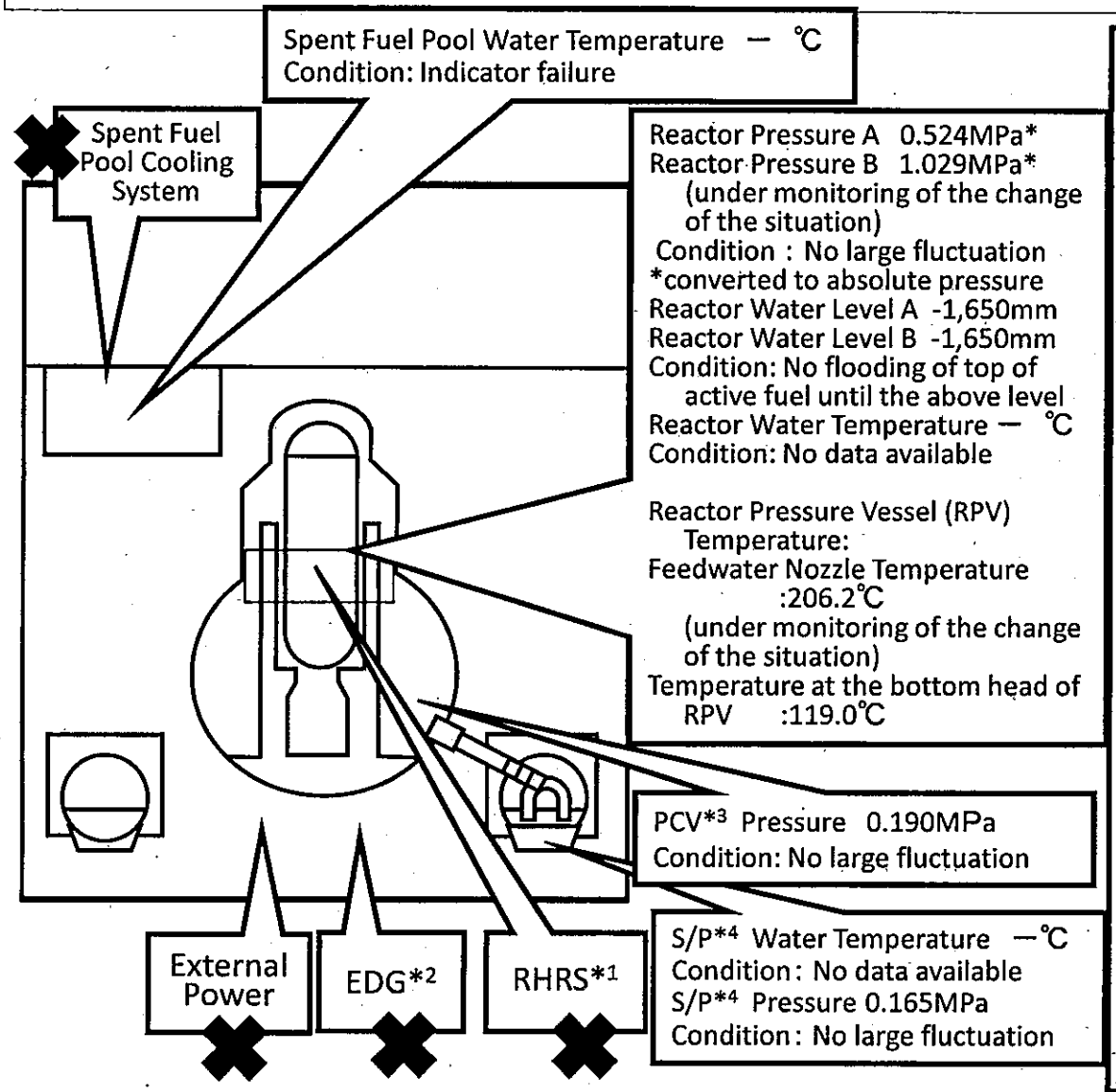
Other information		Common pool: about 32 ℃ (As of 6:40, April 12th)	Unit5: SHC*5 mode (From 19:08 April 12th)	Unit6: Supplemental Fuel Pool Cooling mode (From 17:37 April 12th)

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

*1 D/W : Dry Well
*2 S/C : Suppression Chamber
*3 CAMS : Containment Atmospheric Monitoring System
*4 P/C : Power Center
*5 SHC : Shutdown Cooling

#1 : Measuring instrument malfunction
#2 : Except from data collection
#3 : Under investigation of the change of the situation

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 1
(As of 7:00 April 13th, 2011)



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

Major Events after the earthquake

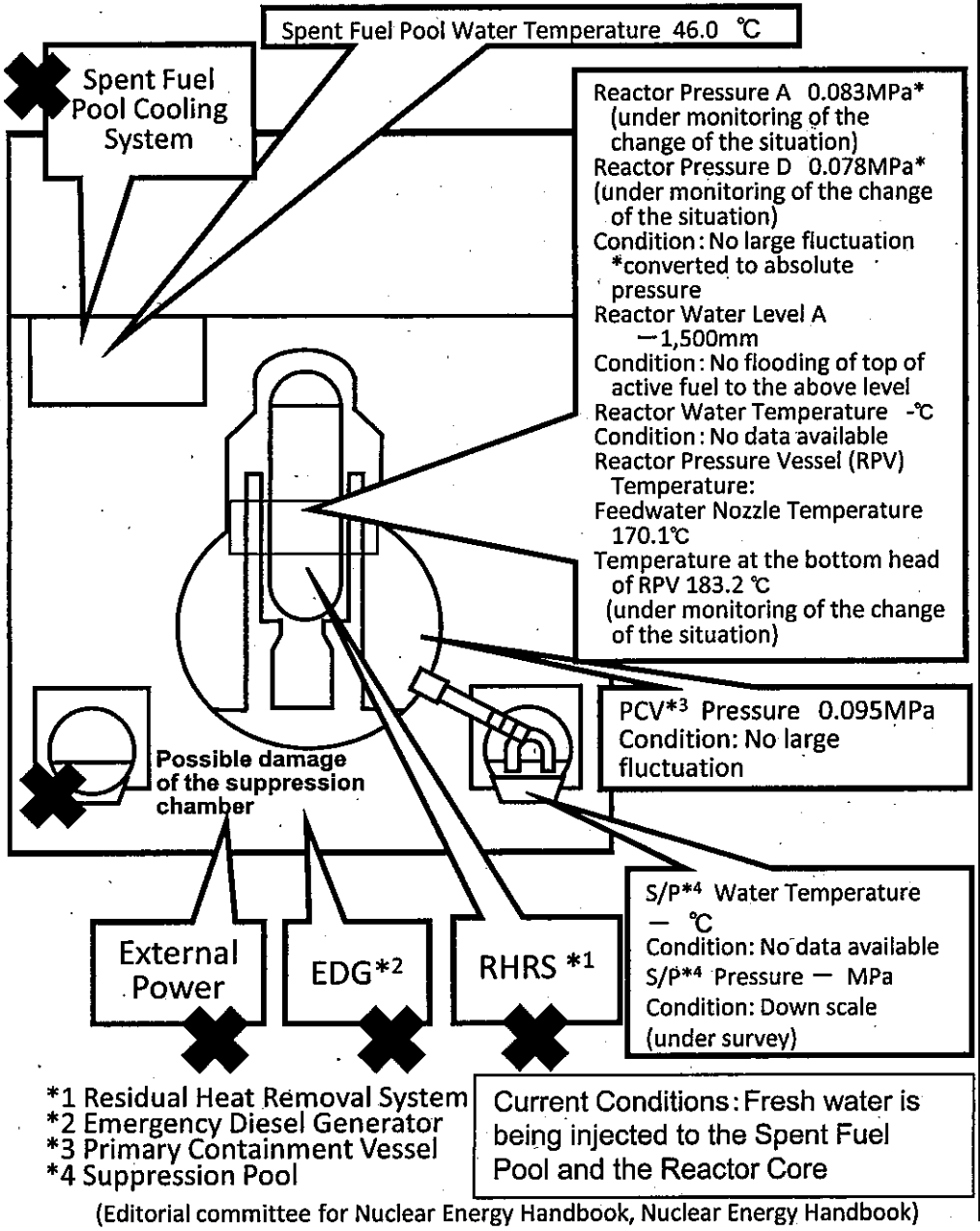
March 11th 14:46 Under operation, Automatic shutdown by the earthquake
March 11th 15:42 Report based on the Article 10 (Total loss of A/C power)
March 11th 16:36 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
March 12th 01:20 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV)
March 12th 10:17 Started to vent.
March 12th 15:36 Sound of explosion
March 12th 20:20 Started to inject seawater and borated water to the Reactor Core.
March 23rd 02:33 The amount of injected water to the Reactor Core was increased utilizing the Feedwater Line in addition to the Fire Extinguish Line. ($2m^3/h \rightarrow 18m^3/h$)
09:00 Switched to the Feedwater Line only.($18m^3/h \rightarrow 11m^3/h$)
March 24th 11:30 Lighting in the Central Control Room was recovered.
March 25th 15:37 Started to inject fresh water.
March 29th 08:32 Switched to the water injection to the Reactor Core using the temporary motor-driven pump.
March 31st 12:00 ～2nd 15:26 Started to transfer the stagnant water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)
March 31st 13:03～16:04 Water spray by Concrete Pump Truck (Fresh water)
April 3rd 12:02 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.
April 3rd 13:55 Started to transfer the water from the Condenser to CST.
April 6th 22:30 Started the operation for the injection of nitrogen to PCV.
April 7th 01:31 Confirmed starting the injection of nitrogen to PCV.
April 9th 04:10 Started using highly pure nitrogen generator in the injection of nitrogen to PCV.
April 10th 09:30 Completed transferring the water from the Condenser to CST.
April 11th around 17:16 Loss of external power supply due to an earthquake occurred and water injection to the Reactor Core and nitrogen injection to PCV were suspended.
April 11th 17:56 External power supply was recovered.
April 11th 18:04 Resumed injecting water to the Reactor Core.
April 11th 23:19 Restarted operation for injecting nitrogen to PCV.
April 11th 23:34 Confirmed starting injection of nitrogen to PCV.

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

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 2

(As of 7:00 April 13th, 2011)



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

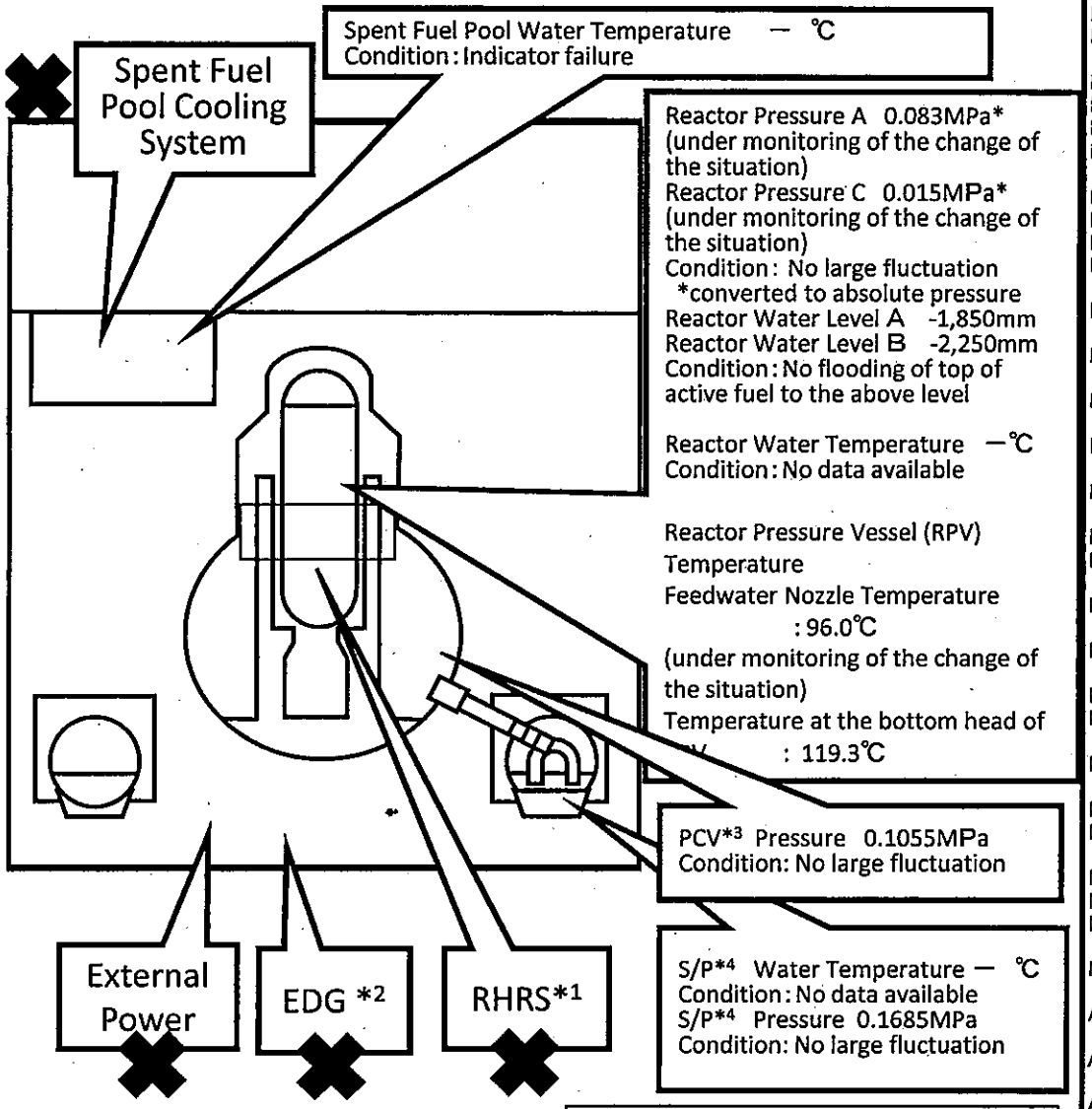
Current Conditions : Fresh water is being injected to the Spent Fuel Pool and the Reactor Core

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

Major Events after the earthquake

March 11th 14:46 Under operation, Automatic shutdown by the earthquake
March 11th 15:42 Report based on the Article 10 (Total loss of A/C power)
March 11th 16:36 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
March 13th 11:00 Started to vent.
March 14th 13:25 Occurrence of the Article 15 event (Loss of reactor cooling functions)
March 14th 16:34 Started to inject seawater to the Reactor Core.
March 14th 22:50 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV)
March 15th 00:02 Started to vent.
March 15th 06:10 Sound of explosion
March 15th around 06:20 Possible damage of the suppression chamber
March 20th 15:05～17:20 Approximately 40 ton seawater injection to the Spent Fuel Pool (SFP) via the Fuel Pool Cooling Line (FPC)
March 20th 15:46 Power Center received electricity.
March 21st 18:22 White smoke generated. The smoke died down and almost invisible at 07:11 March 22nd.
March 22nd 16:07 Injection of around 18 tons of seawater to SFP
March 25th 10:30～12:19 Sea water injection to SFP via FPC
March 26th 10:10 Started to inject fresh water to the Reactor Core.
March 26th 16:46 Lighting in the Central Control Room was recovered.
March 27th 18:31 Switched to the water injection to the core using the temporary motor-driven pump.
March 29th 16:30～18:25 Switched to the temporary motor-driven pump injecting fresh water to SFP.
March 29th 16:45～1st 11:50 Transferred the water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)
March 30th 9:25～23:50 Confirmed malfunction of the temporary motor-driven pump injecting fresh water to SFP(9:45). Switched to the injection using the fire pump Truck, but suspended as cracks were confirmed in the hose. (12:47, 13:10) Resumed injection of fresh water(19:05)
April 1st 14:56～17:05 Injection of fresh water from FPC to SFP using the temporary motor-driven pump.
April 2nd around 9:30 The water, of which the dose rate was at the level of more than 1,000mSv/h, was confirmed to be collected in the pit located near the Intake Channel of Unit 2. The outflow from the lateral surface of the pit into the sea was also confirmed.
April 2nd 17:10 Started to transfer the water from the Condenser to the CST.
April 3rd 12:12 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.
April 3rd 13:47～14:30 20 bags of sawdust, 80 bags of high polymer absorbent and 3 bags of cutting-processed newspaper were put into the Pit for the Conduit.
April 4th 7:08～7:11 Approximately 13kg of tracer (bath agent) was put in from the Pit for the Duct for Seawater Pipe.
April 4th 11:05～13:37 Injection of fresh water from FPC to SFP using the temporary motor-driven pump.
April 5th 14:15 Tracer is confirmed to outflow through the permeable layer around the pit into the sea. 15:07 Started to inject coagulant.
April 6th around 5:38 The water outflow from the lateral surface of the pit was confirmed to stopped.
April 7th 13:29～14:34 Freshwater injection to SFP via FPC (Around 36 ton)
April 9th 13:10 Completed transferring the water from the Condenser to CST.
April 10th 10:37～12:38 Freshwater injection to SFP via FPC using the temporary motor-driven pump (Around 60 ton).
April 11th around 17:16 Loss of external power supply due to an earthquake occurred. Water injection to the Reactor Core was suspended.
April 11th 17:56 External power supply was recovered.
April 11th 18:04 Resumed injecting water to the Reactor Core.
April 12th 19:35 Started to transfer from the trench of the turbine building to the condenser

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 3
(As of 7:00 April 13th, 2011)



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

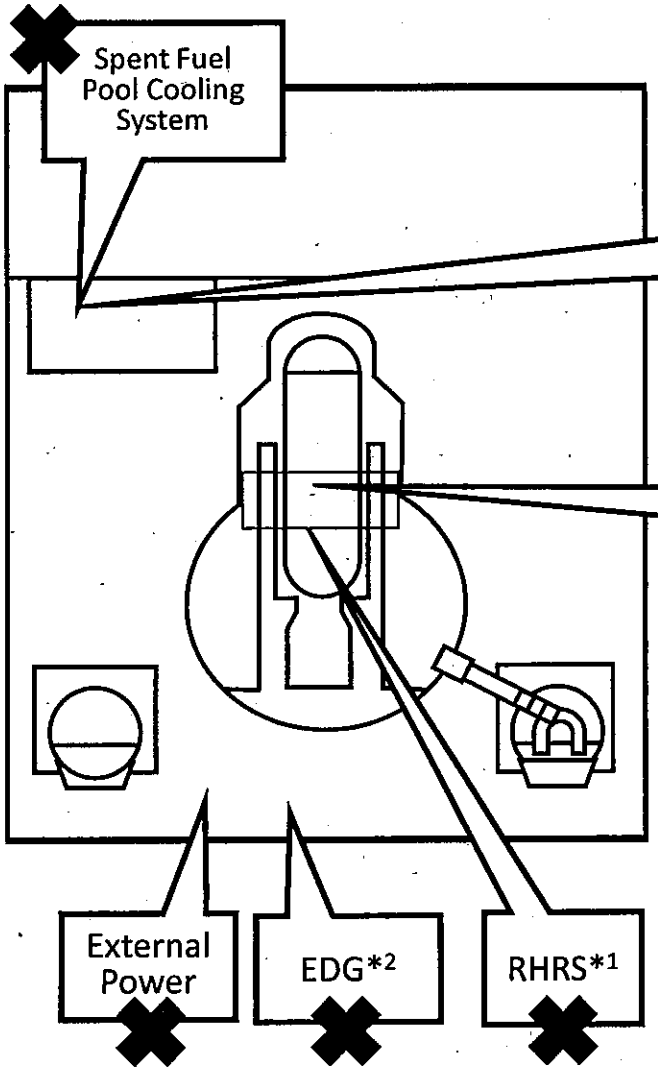
Current Conditions : Fresh water is being injected to the Spent Fuel Pool and the Reactor Core

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

Major Events after the earthquake

March 11th 14:46 Under operation, Automatic shutdown by the earthquake
March 11th 15:42 Report based on the Article 10 (Total loss of A/C power)
March 13th 05:10 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
March 13th 08:41 Started to vent.
March 13th 13:12 Started to inject seawater and borated water to the Reactor Core.
March 14th 05:20 Started to vent.
March 14th 07:44 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV)
March 14th 11:01 Sound of explosion
March 16th around 08:30 White smoke generated.
March 17th 09:48～10:01 Water discharge by the helicopters of Self-Defense Force
March 17th 19:05～19:15 Water spray from the ground by High pressure water-cannon trucks of Police
March 17th 19:35～20:09 Water spray from the ground by fire engines of Self-Defense Force
March 18th before 14:00～14:38 Water spray from the ground by 6 fire engines of Self-Defense Force
March 18th ～14:45 Water spray from the ground by a fire engine of the US Military
March 19th 00:30～01:10 Water spray by Hyper Rescue Unit of Tokyo Fire Department
March 19th 14:10 ～ 20th 03:40 Water spray by Hyper Rescue Unit of Tokyo Fire Department
March 20th 11:00 Pressure of PCV rose(320kPa).Afterward fell.
March 20th 21:36 ～ 21st 03:58 Water spray by Hyper Rescue Unit of Tokyo Fire Department
March 21st around 15:55 Grayish smoke generated and was confirmed to be died down at 17:55.
March 22nd 15:10 ～16:00 Water spray by Hyper Rescue Unit of Tokyo Fire Department and Osaka City Fire Bureau.
March 22nd 22:46 Lighting in the Central Control Room was recovered.
March 23rd 11:03 ～13:20 Injection of about 35 ton of sea water to the Spent Fuel Pool (SFP) via the Fuel Pool Cooling Line (FPC)
March 23rd around 16:20 Black smoke generated and was confirmed to died down at around 23:30 and 24th 04:50.
March 24th 05:35～16:05 Injection of around 120 ton of sea water to SFP via FPC
March 25th 13:28～16:00 Water spray by Kawasaki City Fire Bureau supported by Tokyo Fire Department
March 25th 18:02 Started fresh water injection to the core.
March 27th 12:34～14:36 Water spray by Concrete Pump Truck
March 28th 17:40～31st around 8:40 Transferring the water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)
March 28th 20:30 Switched to the water injection to the core using a temporary motor-driven pump.
April 3rd 12:18 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.
April 11th around 17:16 Loss of external power supply of Unit 1 and 2 occurred and water injection to the Reactor Core was suspended.
April 11th 18:04 External power supply of Units 1 and 2 recovered (April 11th 17:56). Resumed injecting water to the Reactor Core.
<Water spray by Concrete Pump Truck (Fresh water)>
March 29th 14:17～18:18, March 31st 16:30～19:33, April 2nd 09:52～12:54, April 4th 17:03～19:19, April 7th 06:53 ～08:53, April 8th 17:06～20:00, April 10th 17:15 ～19:15, April 12th 16:26～17:16

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 4
(As of 7:00 April 13th, 2011)



In periodic inspection outage

Spent Fuel Pool Water Temperature — ℃
Condition: Indicator failure

No fuel is inside the Reactor Core

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

Major events after the earthquake

In periodic inspection outage when the earthquake occurred
March 14th 04:08 Water temperature in the Spent Fuel Pool (SFP), 84℃
March 15th 06:14 Confirmed the partial damage of wall in the 4th floor.
March 15th 09:38 Fire occurred in the 3rd floor. (12:25 extinguished)
March 16th 05:45 Fire occurred. TEPCO couldn't confirm any fire on the ground. (06:15)
March 20th 08:21～09:40 Water spray over SFP by Self-Defense Force
March 20th around 18:30～19:46 Water spray over SFP by Self-Defense Force
March 21st 06:37～08:41 Water spray over SFP by Self-Defense Force
March 21st around 15:00 Work for laying cable to Power Center was completed.
March 22nd 10:35 Power Center received electricity.

<Water spray by Concrete Pump Truck (Seawater)>
March 22nd 17:17～20:32, March 23rd 10:00～13:02, March 24th 14:36～17:30, March 25th 19:05～22:07, March 27th 16:55～19:25

March 25th 06:05～10:20 Sea water injection to SFP via the Fuel Pool Cooling Line (FPC)
March 29th 11:50 Lighting in the Central Control Room was recovered.
April 11th around 17:16 An earthquake occurred.
April 12th 12:00～13:04 Sampled the water in SFP.

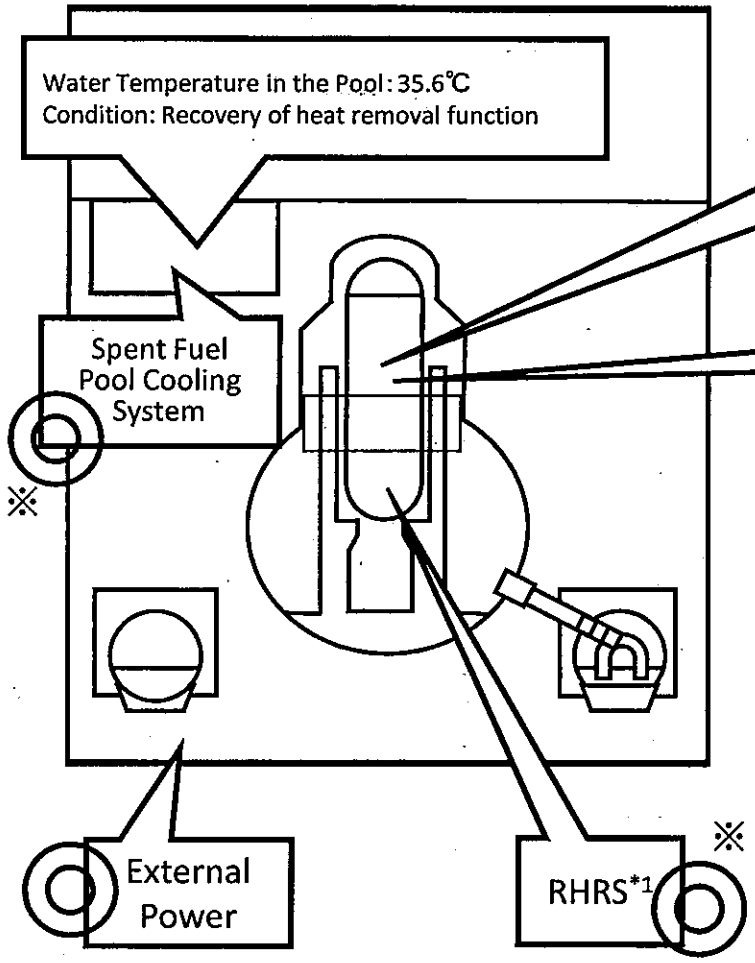
< Water spray by Concrete Pump Truck (Fresh water)>
March 30th 14:04～18:33, April 1st 08:28～14:14, April 3rd 17:14～22:16, April 5th 17:35～18:22, April 7th 18:23～19:40, April 9th 17:07～19:24, April 13th 0:30～6:57

Current Conditions : No fuel is in RPV*3.
Fresh water is being injected to the Spent Fuel Pool.

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 5
(As of 7:00 April 13th, 2011)

In periodic inspection outage



*1 Residual Heat Removal System

Reactor Pressure: 0.104MPa*
Reactor Water Level: 1,586mm
Reactor Water Temperature: 32.9℃
Condition: Pressure is under control.
*converted to absolute pressure

Reactor Pressure Vessel Temperature:
Monitoring by Reactor Water Temperature

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

Major Events After the Earthquake:

March 20th 14:30 Cold shutdown

March 21st 11:36 Receiving electricity from external power supply

March 23rd 17:24 Pump for Residual Heat Removal Seawater System (RHRS) was automatically stopped when the power supply was switched from the temporary to the permanent.

March 24th 16:14 Repair of the RHRS pump was completed.

March 24th 16:35 Started to cooling.

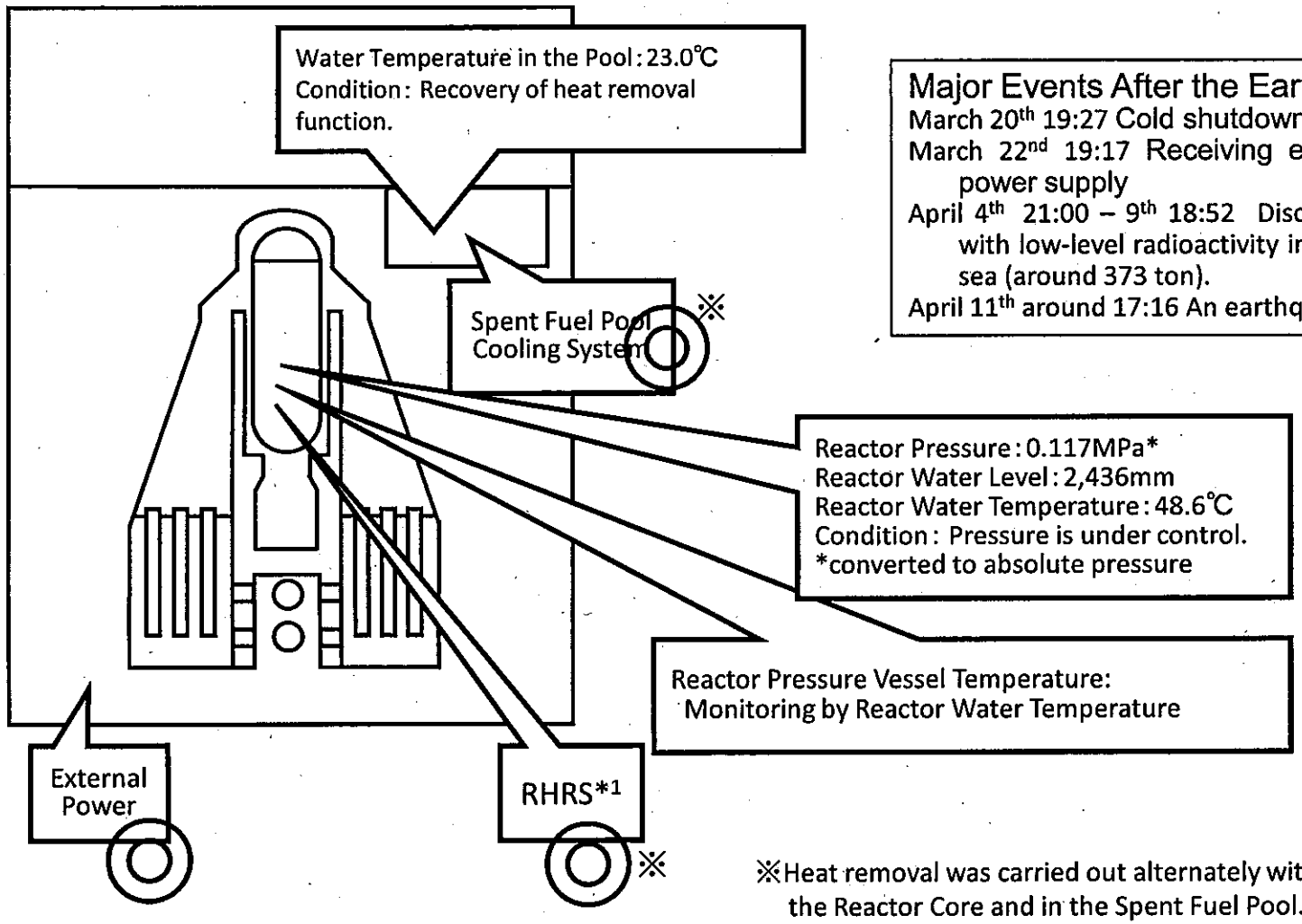
April 4th 21:00 – 8th 12:14 Discharged the groundwater with low-level radioactivity in the Sub Drain Pit to the sea (around 950 ton).

April 11th around 17:16 An earthquake occurred.

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 6
(As of 7:00 April 13th, 2011)

In periodic inspection outage



Major Events After the Earthquake :

March 20th 19:27 Cold shutdown

March 22nd 19:17 Receiving electricity from external power supply

April 4th 21:00 – 9th 18:52 Discharged the groundwater with low-level radioactivity in the Sub Drain Pit to the sea (around 373 ton).

April 11th around 17:16 An earthquake occurred.

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

*1 Residual Heat Removal System

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