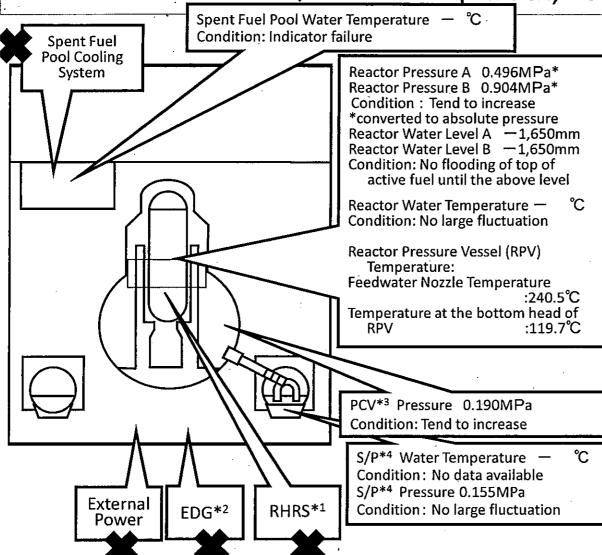
Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 1 (As of 6:00 April 9th, 2011) Major Events after the earthquake



- 11th 14:46 Under operation, Automatic shutdown by the earthquake
- 11th 15:42 Report based on the Article 10 (Total loss of A/C power)
- 11th 16:36 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
- 12th 01:20 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV)
- 12th 10:17 Started to vent.
- 12th 15:36 Sound of explosion
- 12th 20:20 Started to inject seawater and borated water to core.
- 23rd 02:33 The amount of injected water to the Rector Core was increased utilizing the Feedwater Line in addition to the Fire Extinguish Line. (2m³/h →18m³/h) 09:00 Switched to the Feedwater Line only.(18m³/h →11m³/h)
- 24th 11:30 Lighting in the Central Control Room was recovered.
- 25th 15:37 Started fresh water injection.
- 29th 08:32 Switched to the water injection to the core using the temporary motor-driven pump.
- 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)
- 31st 13:03~16:04 Water spray by Concrete Pump Truck (Fresh water)
- 3rd 12:02 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.
- 3rd 13:55 Started to transfer the water from the condenser to CST.
- 6^{th} 22:30 Started the operation for the injection of nitrogen to PCV.
- 7th 01:31 Confirmed starting the injection of nitrogen to PCV.

*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 core

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

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 2

(As of 6:00 April 9th, 2011)

Spent Fuel Pool Water Temperature 50.0 °C Spent Fuel Reactor Pressure A 0.083MPa* **Pool Cooling** Reactor Pressure D 0.081MPa* System Condition: No large fluctuation *converted to absolute pressure Reactor Water Level A -1,500mm Condition: No flooding of top of active fuel to the above level Reactor Water Temperature Condition: No data available Reactor Pressure Vessel (RPV) Temperature: Feedwater Nozzle Temperature 141.6℃ Temperature at the bottom head of RPV — ℃ (Indicator failure) PCV*3 Pressure 0.095MPa Condition: No large fluctuation Possible damage of the suppression S/P*4 Water Temperature chamber Condition: No data available S/P*4 Pressure - MPa Condition: Down scale (under survey) External RHRS *1 EDG*2 Power *1 Residual Heat Removal System Current Conditions: Fresh water *2 Emergency Diesel Generator *3 Primary Containment Vessel *4 Suppression Pool is being injected to the Spent

Major Events after the earthquake

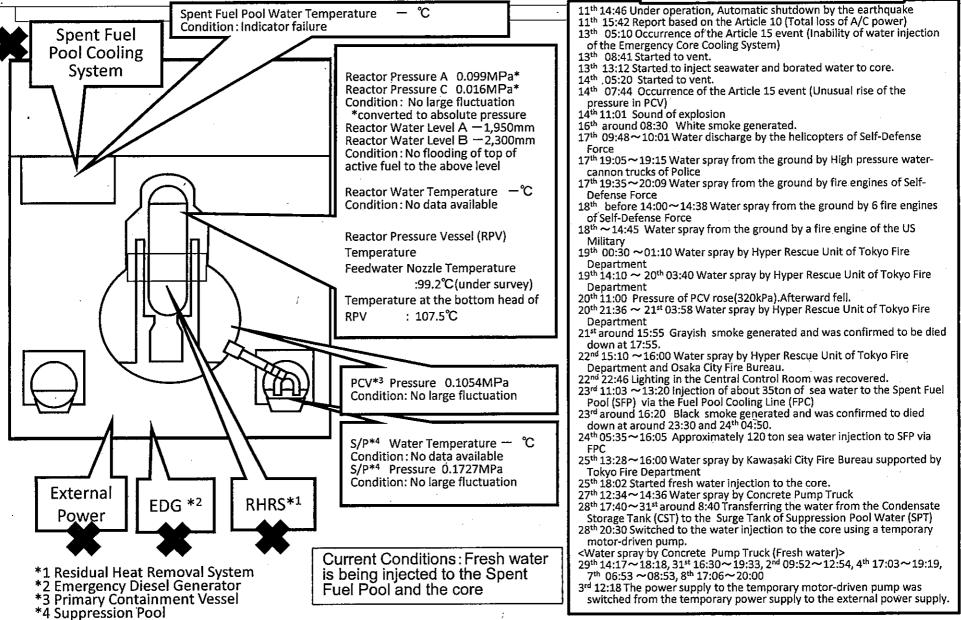
- 11th 14:46 Under operation, Automatic shutdown by the earthquake
- 11th 15:42 Report based on the Article 10 (Total loss of A/C power)
- 11th 16:36 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core Cooling System)
- 13th 11:00 Started to vent.
- 14th 13:25 Occurrence of the Article 15 event (Loss of reactor cooling functions)
- 14th 16:34 Started to inject seawater to the Reactor Core.
- 14th 22:50 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV)
- 15th 00:02 Started to vent.
- 15th 06:10 Sound of explosion
- 15th around 06:20 Possible damage of the suppression chamber
- 20th 15:05~17:20 Approximately 40 ton seawater injection to the Spent Fuel Pool (SFP) via the Fuel Pool Cooling Line (FPC)
- 20th 15:46 Power Center received electricity.
- 21st 18:22 White smoke generated. The smoke died down and almost invisible at 07:11
- 22nd 16:07 Injection of around 18 tons of seawater to SFP
- 25th 10:30 ~ 12:19 Sea water injection to SFP via FPC
- 26th 10:10 Started to inject fresh water to the Reactor Core.
- 26th 16:46 Lighting in the Central Control Room was recovered.
- 27th 18:31 Switched to the water injection to the core using the temporary motor-driven
- 29th 16:30~18:25 Switched to the temporary motor-driven pump injecting fresh water to
- 29th 16:45~1st 11:50 Transferred the water from the Condensate Storage Tank (CST) to the Surge Tank of Suppression Pool Water (SPT)
- 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)
- 1st 14:56~17:05 Injection of fresh water from FPC to SFP using the temporary motor-driven
- 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.
- 2nd 17:10 Started to transfer the water from the condenser to the Condensate Storage Tank
- 3rd 12:12 The power supply to the temporary motor-driven pump was switched from the temporary power supply to the external power supply.
- 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.
- 4th 7:08~7:11 Approximately 13kg of tracer (bath agent) was put in from the Pit for the Duct for Seawater Pipe.
- 4th 11:05 ~ 13:37 injection of fresh water from FPC to SFP using the temporary motor-driven
- 5th 14:15 Tracer is confirmed to outflow through the permeable layer around the pit into the sea.
 - 15:07 Started to inject coagulant.
- 6th around 5:38 The water outflow from the lateral surface of the pit was confirmed to
- 7th 13:29~14:34 Freshwater injection to SFP via FPC (Around 36 ton)

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

Fuel Pool and the core

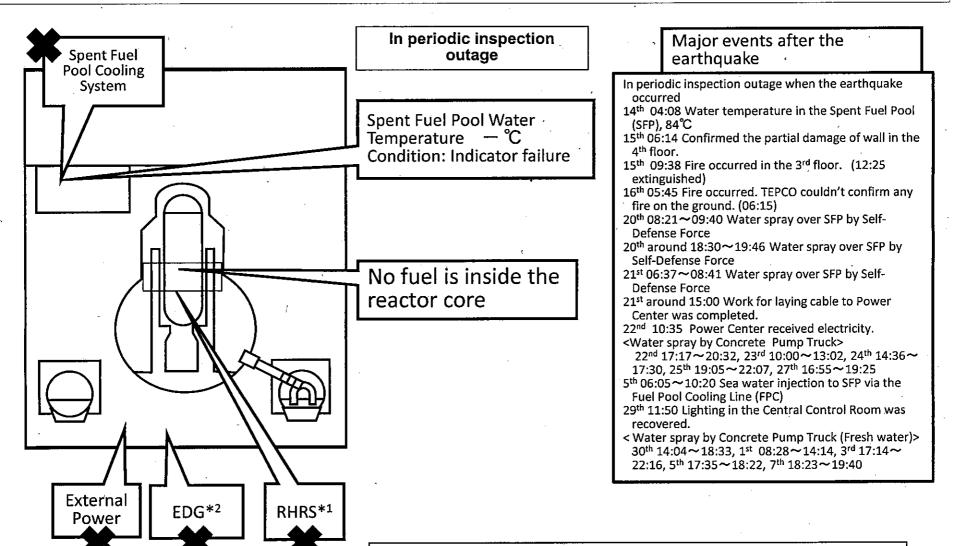
Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 3

(As of 6:00 April 9th, 2011)



Major Events after the earthquake

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 4 (As of 6:00 April 9th, 2011)



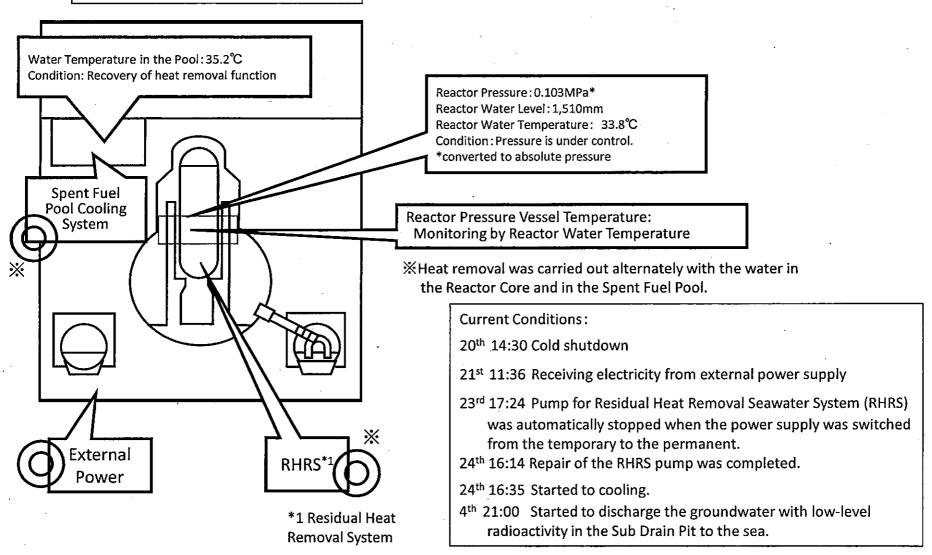
- *1 Residual Heat Removal System
- *2 Emergency Diesel Generator
- *3 Reactor Pressure Vessel

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

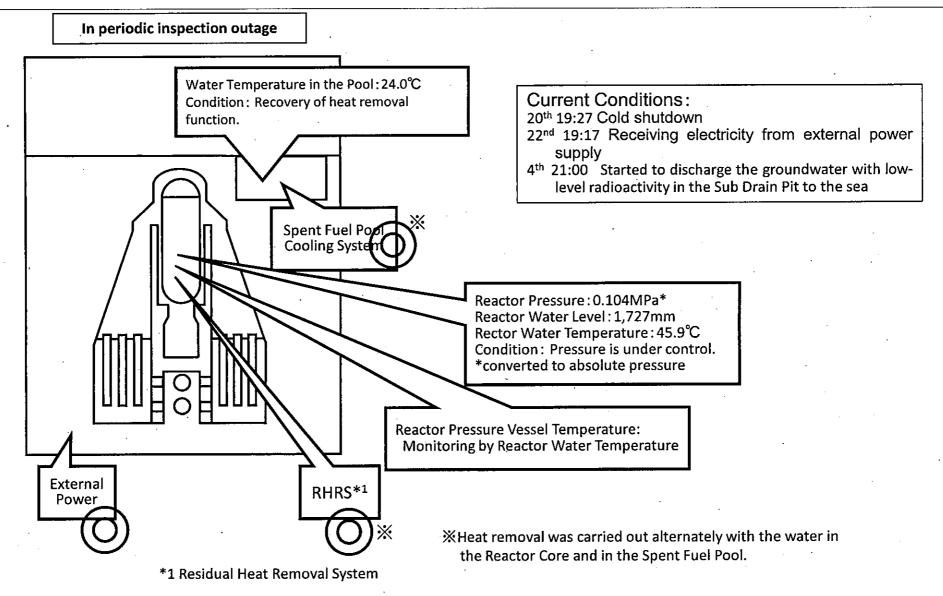
(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 5 (As of 6:00 April 9th, 2011)

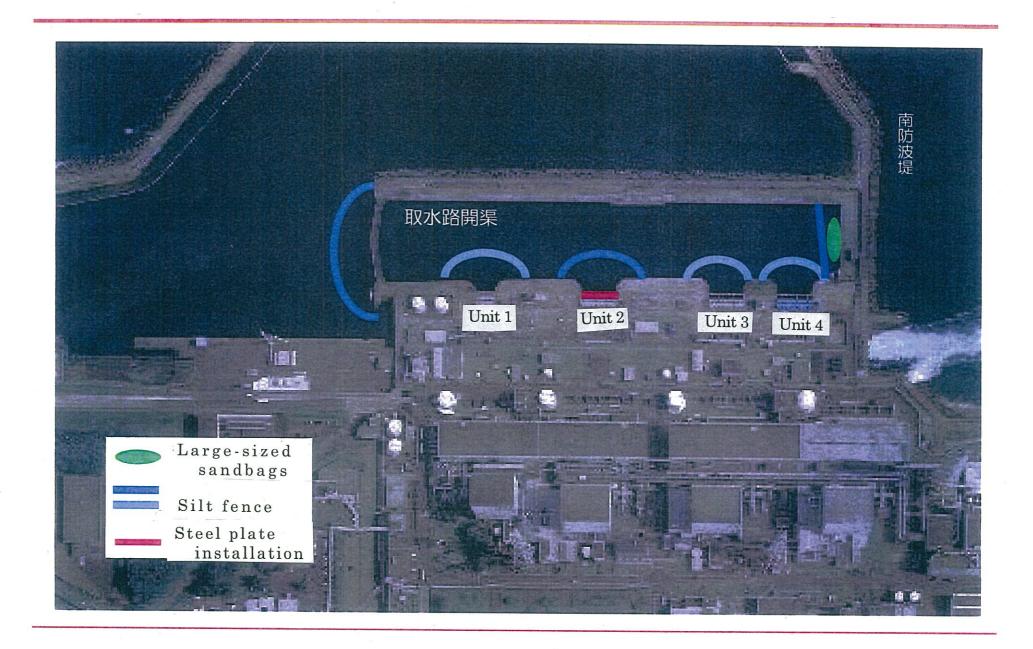




Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 6 (As of 6:00 April 9th, 2011)



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



Extract



April 9, 2011 Nuclear and Industrial Safety Agency

Seismic Damage Information (the 82th Release) (As of <u>08:00 April 9th</u>, 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
 - Fresh water spray (around 77t) over the Spent Fuel Pool of Unit 3 using Concrete Pump Truck (50t/h) was carried out. (From 17:06 till 20:00 April 8th)
 - The test scattering of antiscattering agent to prevent the radioactive materials on the ground surface from being scattered was carried out in the area of about 500 m² on the mountain-side of the Common Pool. (April 8th)
 - The pumping out of the water in the Radioactive Waste Treatment Facilities, which was suspended by the earthquake off the coast of Miyagi Prefecture occurred on 7 April, was resumed. (14:30 April 8th)

For more information:

NISA English Home Page

http://www.nisa.meti.go.jp/english/index.html

Extract



April 9, 2011 Nuclear and Industrial Safety Agency

Seismic Damage Information (the 83th Release) (As of 15:30 April 9th, 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 transfer of the water in the Condenser to the Condensate Storage Tank of Unit 2 was completed. (13:10 April 9th)

For more information:

NISA English Home Page

http://www.nisa.meti.go.jp/english/index.html

Nuclear Accident at the Fukushima Dai-ichi Nuclear Power Station

April 9, 2011

Contents

A. Japan Faces Unprecedented Challenge (Enormous Earthquakes, Tsunamis and Nuclear Accident)

- 1. Rescuing Efforts and Foreign Assistance
- 2. Fukushima Dai-ichi Nuclear Power Station

B. Key Challenges

- 1. Cool Down the Reactors
- 2. Contain Spread of Radioactive Substances (sea, soil and atmosphere)
- 3. Rigorous and Intensive Monitoring
- 4. Ensure the Safety of Food, Drinking Water and On-site Workers

C. Information Sharing and Cooperation with the International Community

- 1. Cooperation with the IAEA
- 2. Press Reliases by International Organizations
- 3. Speedy Dissemination of Accurate Information

A. Japan Faces Unprecedented Challenge

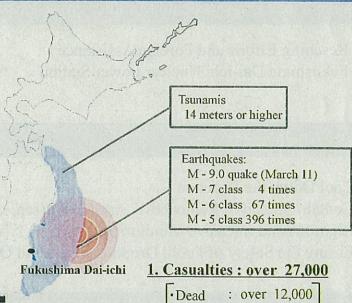
(Enormous Earthquakes, Tsunamis and Nuclear Accident)

- 1. Rescuing Efforts and Foreign Assistance
- 2. Fukushima Dai-ichi Nuclear Power Station

3

A. Japan Faces an Unprecedented Challenge

(Enormous Earthquake, Tsunamis and Nuclear Accident)



• Dead : over 12,000 • Missing : over 15,000

TOKTOM

2. Evacuees : over 150,000

(As of April 8rd)

Contents

A. Japan Faces Unprecedented Challenge (Enormous Earthquakes, Tsunamis and Nuclear Accident)

- 1. Rescuing Efforts and Foreign Assistance
- 2. Fukushima Dai-ichi Nuclear Power Station

B. Key Challenges

- 1. Cool Down the Reactors
- 2. Contain Spread of Radioactive Substances (sea, soil and atmosphere)
- 3. Rigorous and Intensive Monitoring
- 4. Ensure the Safety of Food, Drinking Water and On-site Workers

C. Information Sharing and Cooperation with the International Community

- 1. Cooperation with the IAEA
- 2. Press Reliases by International Organizations
- 3. Speedy Dissemination of Accurate Information

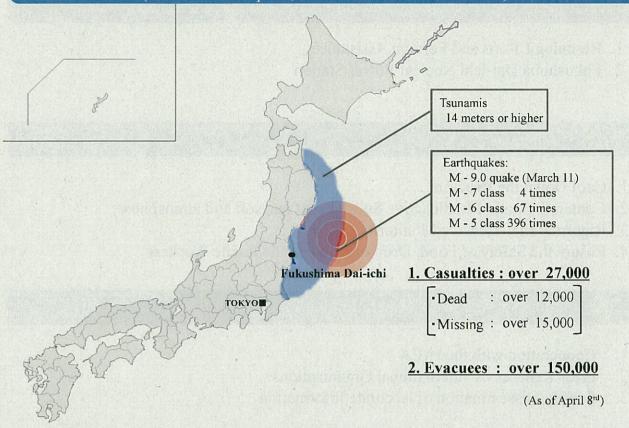
Nuclear Accident at the Fukushima Dai-ichi Nuclear Power Station

> April 9, 2011 Ministry of Foreign Affairs of Japan

2

A. Japan Faces an Unprecedented Challenge

(Enormous Earthquake, Tsunamis and Nuclear Accident)



A. Japan Faces Unprecedented Challenge

(Enormous Earthquakes, Tsunamis and Nuclear Accident)

- 1. Rescuing Efforts and Foreign Assistance
- 2. Fukushima Dai-ichi Nuclear Power Station

1. Rescuing Efforts and Foreign Assistance

Japan deeply appreciates the assistance offered from

- 134 countries and regions and
- 39 international organizations

(Rescue teams were sent from 24 countries and region)



Ministry of Defens



US Navy/US Pacific Comma (Operation Tomodachi)

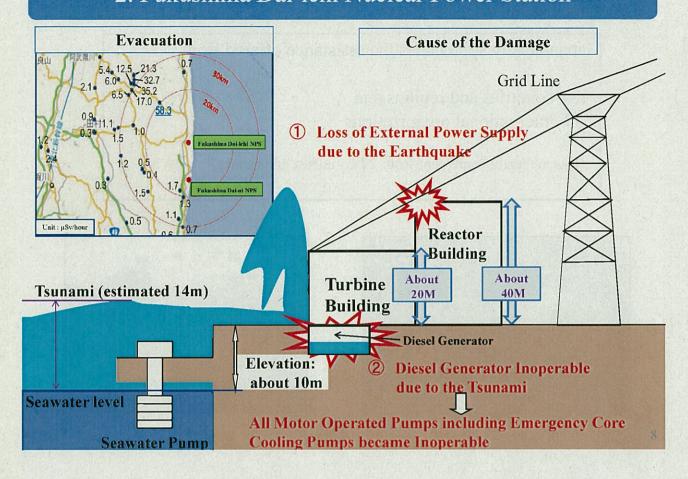
Nuclear Reactors Near Epicenter of the Earthquake

4 Nuclear Power Stations with 14 Units

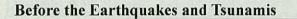


automatic	cold				
shut down	shut down				
L					
inspection					
	>				
	automatic shut down Periodical inspection				

2. Fukushima Dai-ichi Nuclear Power Station



2. Fukushima Dai-ichi Nuclear Power Station





After the Earthquakes and Tsunamis



TEPCO

Air Photo Service Inc (Myoko, Niigata Japan)

1. Cool Down the Reactors

(As of April 8)

		Unit 1	Unit 2	Unit 3	Unit 4
Туре	e / MW / Commercial Operation	BWR / 460 / Mar 71-	BWR / 784 / Jul 74-	BWR / 784 / Mar 76-	BWR / 784 / Oct 78-
Stati	us at time of Earthquake	In Service	In Service	In Service	Periodical Inspection Outage
	Automatic Shutdown	1	1	1	_
	Fresh Water Injection	1	1	1	-
	Water Level [mm] (distance from the top of fuel)	-1,650 (A)	-1,500 (A)	-1,850 (A)	
В		-1,650 (B)	N/A (B)	-2,250 (B)	
R P	Reactor Pressure [Mpa g]	0.395 (A)	-0.020 (A)	-0.004 (A)	
V		0.793 (B)	-0.020 (D)	-0.079 (C)	
	Temperature — Feedwater Nozzle	246.6℃	141.2℃	N/A	
	- Bottom Head of RPV	119.4℃	N/A	110.7℃	
S F P	Fresh Water Injection	1	4	1	4
	Temperature	24°C*	53℃	60℃°	57°C*
Build	ling	Damage	Slight Damage	Damage	Damage
1	Power hting of Central Operation Room**)	1	1	1	1

^{*}Temperature based on reading of the thermograph from air by Ministry of Defense. (the indicators attached to the SFPs are broken)

11

B. Key Challenges

- 1. Cool Down the Reactors
- Contain Spread of Radioactive Substances (sea, soil and atmosphere)
- 3. Rigorous and Intensive Monitoring
- 4. Ensure the Safety of Food, Drinking Water and On-site Workers

^{**}Facilities are under-checking.

1. Cool Down the Reactors (Unit 2) (As of April 8, 2011) Injection ■Fuel Bundle Damaged ■ Spent Fuel in the Pool Spent Fuel Pool Cooling System -587 + 28 (new)Injecting Fresh water or Seawater Major Events · Mar.13- Venting started · Mar.14- Seawater injection to reactor core ·Mar.15- Sound of explosion Possible damage of the suppression chamber · Mar.20- Seawater injection to spent fuel pool

Recovered

External Power

(Mar.26- connected to the central control room)

Damaged

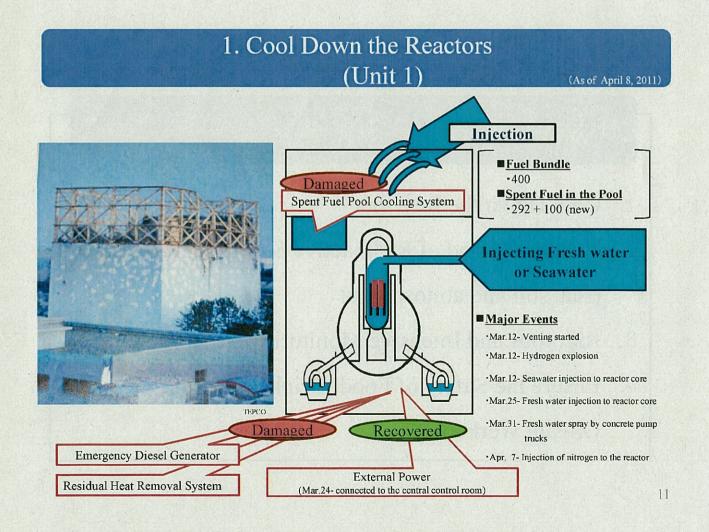
Emergency Diesel Generator

Residual Heat Removal System

·Mar.26- Fresh water injection to reactor core

12

· Apr. 1- Fresh water injection to SFP

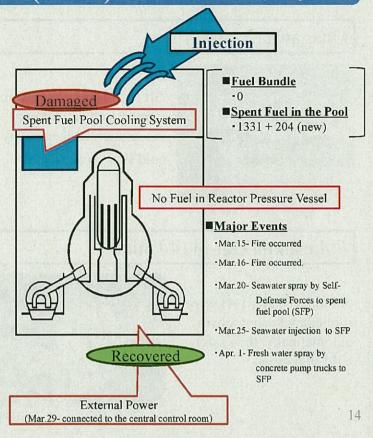


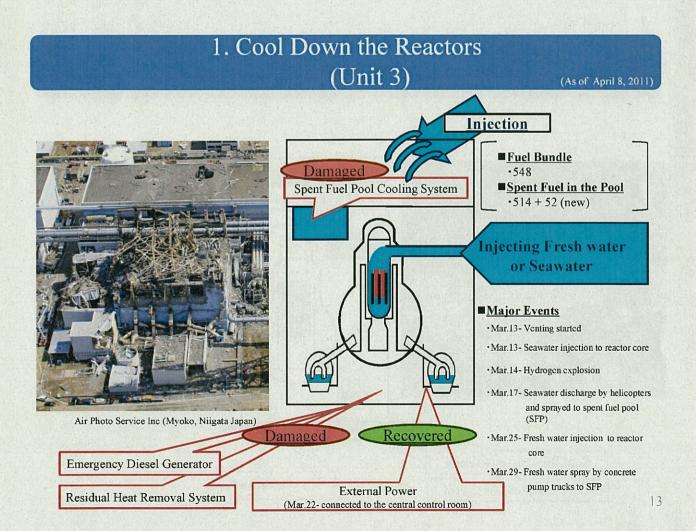
1. Cool Down the Reactors (Unit 4)

(As of April 8, 2011



Air Photo Service Inc (Myoko, Niigata Japan)





Other Nuclear Power Stations in the Tohoku Area

Onagawa (3 Units)

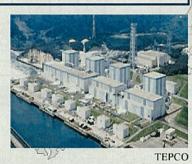


All units (Units 1-3) were immediately shut down automatically, then safely cold shut down.

Tohoku Electric Power Co., Inc

Fukushima Dai-ni (4 Units)

All units (Units 1-4) were immediately shut down automatically, then safely cold shut down.



Onagawa

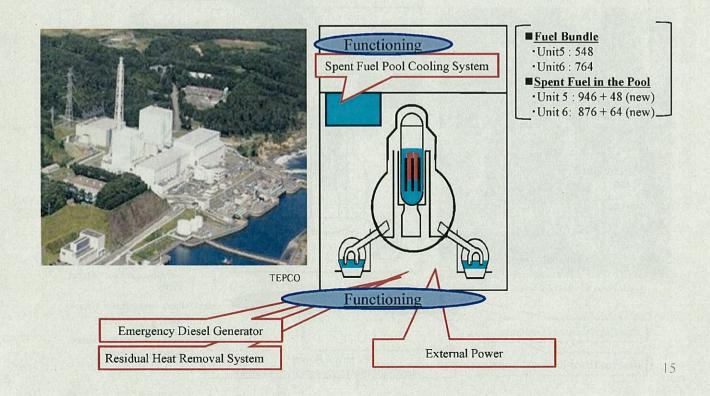
Fukushima Dai-ichi

Fukushima Dai-ni

16

1. Cool Down the Reactors (Unit 5&6)

(As of April 8, 2011)



2. Contain Spread of Radioactive Substances

(sea, soil and atmosphere)

Experts are making the utmost effort to prevent radioactive substances contained in dust, debris and vapor from spreading.

Spraying synthetic materials on the surface of the ground to prevent the spread of radioactive substances



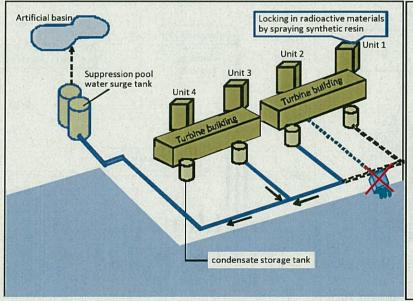
TEPCO

18

2. Contain Spreads of Radioactive Substances

(sea, soil and atmosphere)

The Japanese Government and TEPCO are making the utmost effort to prevent the dispersion of flow-out radioactive contaminated water.



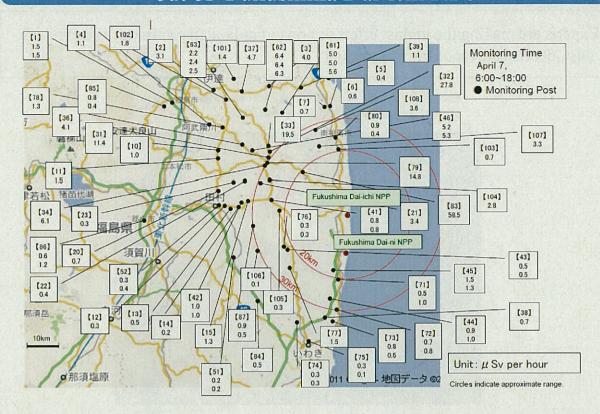
■Major Events

· Mar. 27

Stagnant water on the basement floor of the turbine of Unit2 and in the trenches found to be highly contaminated.

- Mar. 29
 Stagnant water in the trenches and the turbine building transferred to the storage tank, then to the surge tank.
- Apr. 1
 Highly contaminated water
 discovered leaking into the sea.
- Apr. 6
 Leak of contaminated water into the sea was stopped.

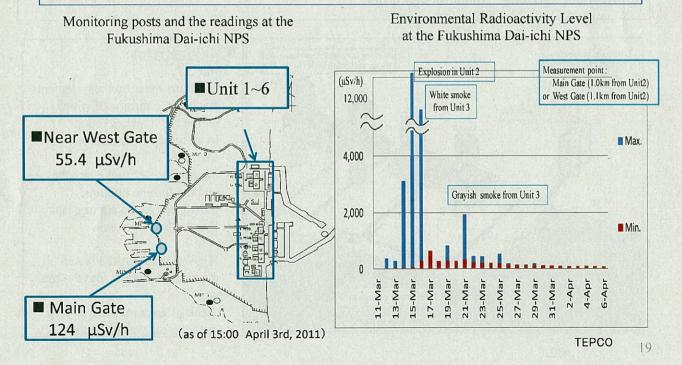
Readings at Monitoring Posts out of Fukushima Dai-ichi NPS

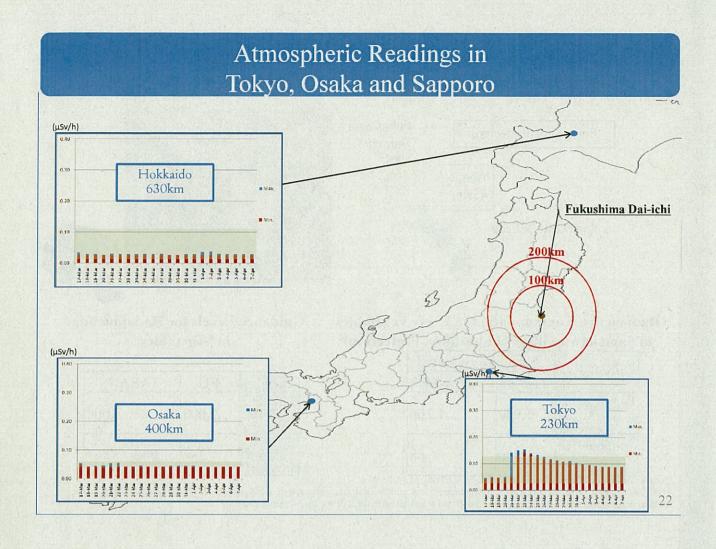


20

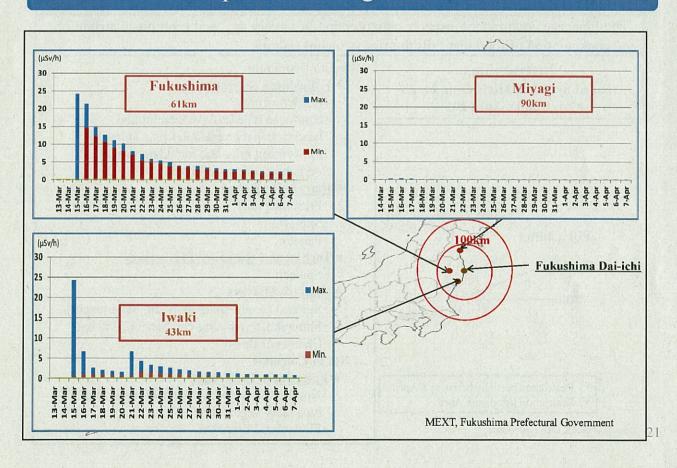
3. Rigorous and Intensive Monitoring

TEPCO monitors radioactivity levels every ten minutes and releases the results immediately. Radioactivity levels rose on March 15th, but have since fallen and remain low.

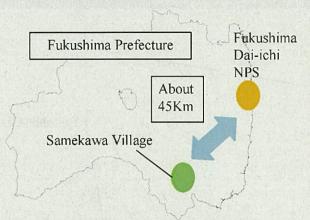




Atmospheric Readings within 100km



Safety of Farm Products







Radioactive Contamination in Leafy Vegetables in Samekawa-village (Fukushima Prefecture)

(h a/h a)	Samekawa-village	
(bq/kg)	21-Mar	24-Mar
radioactive iodine	5 9000	1,200
radioactive cesium	1,700	68

Source: Ministry of Health, Labour and Welfare, EURATOM, IAEA

Guidance Levels for Radionuclides in Vegetables

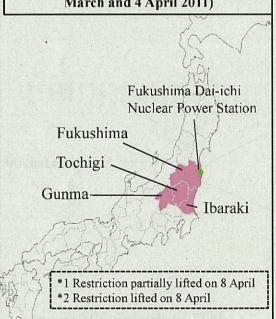
Japan	EU	IAEA*	
2,000	2,000		3,000
500	1,250	1,000	(Cs134)

*OIL(Operational Intervention Levels)6: Locally produced food, milk and water have been screened, and all members of the public, including infants, children and prognant women can safely drink the milk and water and cat the food during the emergency phase.

4. Ensure the Safety of Food and Water

The Japanese government inspects radiation dosages every day, and prohibits distribution and consumption of food that fails to meet stringent criteria.

Instructions (issued by Prime Minister on 21, 23 March and 4 April 2011)



Ministry of Health, Labour and Welfare

... Not to Distribute

* Fukushima Prefecture

- •Fresh raw milk*1
- Non-head type leafy vegetables and head type leafy vegetables (e.g. spinach)
- •Flowerhead brassicas including turnip (e.g. broccoli, cauliflower)

* Ibaraki Prefecture

- ·Fresh raw milk
- · Spinach
- · Parsley

* Tochigi and Gunma*2 Prefectures

· Spinach

* Chiba Prefecture

- · Spinach (Asahi-shi, Katori-shi, Tako-machi)
- Shungiku, Qing-geng-cai, Sanchu, Parsley, Celery (Asahi-shi)

... Not to Consume

* Fukushima Prefecture

- Non-head type leafy vegetables and head type leafy vegetables
- ·Flowerhead brassicas

24

Safety of On-site Workers

The Japanese Government closely supervises on-site workers' health conditions, limiting the level of their maximum exposure to radiation to 250mSv.

No workers in Fukushima NPS have been exposed to 250mSv or more.

On March 24, three workers exposed to more than 170mSv were hospitalized, but were released four days later as no health problems were found.

Emergency Dose Limit

mSv	JAPAN
emergency dose limit	100 ↓ 250
	(limit raised for Fukushima emergency workers)

Workers Exposed to Radiation in Fukushima Dai-ichi NPS, as of April 5

level of exposure	number of workers	
more than 100mSv	21	
more than 250mSv	0	

Nuclear and Industrial Safety Agency

26

Safety of Drinking Water

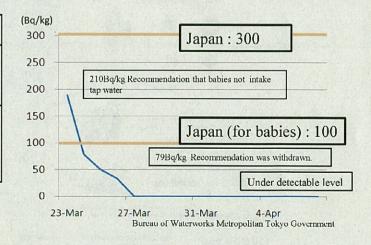
The Japanese Government has been implementing necessary measures based on its stringent criteria for radionuclides in drinking water, and monitoring radionuclide levels every day.

Guidance Levels for Radionuclides in Drinking Water

(Bq/kg)	Japan		EU
radioactive		300	500
iodine(I131)	(for babies)	100	500
radioactive cesium		200	1,000

Ministry of Health, Labour and Welfare, EURATOM

Radioactive Iodine(I131) in Drinking-Water in Tokyo (Kanamachi filter plant)

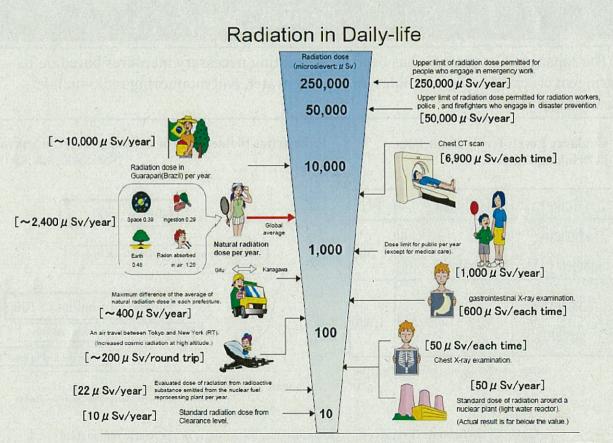


^{*}On March 23, the Japanese Government recommended that the residents in Tokyo area refrain from having their babies intake tap water, but it withdraw the recommendation in two days.

C. Information Sharing and Cooperation with the International Community

- 1. Cooperation with the IAEA
- 2. Press Releases by International Organizations
- 3. Speedy Dissemination of Accurate Information

28



2. Press Releases by International Organizations



International Civil Aviation Organization (ICAO)



International Maritime Organization (IMO)

ICAO and IMO released the same press releases twice

- -'No Restrictions on Travel to Japan' on 18th March (ICAO) and 21th March (IMO)
 - International flight and maritime operations can continue normally into and out of Japan's major airports and sea ports, excluding those damaged by the tsunami; according to the latest information available from WHO, IAEA, WMO, IMO and ICAO
- 'Current Radiation Levels In Japan And Travel Advice' on 1st April
 - Radioactive material from the damaged Fukushima Daiichi Plant is gradually spreading outside of Japan into global atmosphere but at extremely low concentrations that do not present health or transportation safety hazards, according to the United Nations organizations closely monitoring the situation.
 - Screening for radiation of passengers arriving from Japan is currently considered unnecessary at airports or seaports around the world.



World Health Organization (WHO) -FAQs 'Japan Nuclear Concerns' on 5th April

• At this time, WHO is not advising general restrictions on travel to Japan.

30

1. Cooperation with the IAEA

1. Information Sharing

- (1) Japan has been providing facility-related and other relevant information to the IAEA.
- (2) Nuclear Industry Safety Agency (NISA) provided updates on situations of the Fukushima Dai-ichi Nuclear Power Station at the IAEA Technical Briefing (21st March) and at the side event of the Fifth Review Meeting of the Contract Parties to the Convention on Nuclear Safety (4th April).

2. IAEA Expert Missions

The IAEA's assistance in the aftermath of the incidents involving the nuclear power plants in Japan is underway in the form of the dispatch of a series of the IAEA experts to Japan mainly in the fields of environmental monitoring. Such assistance includes:

- (1) the dispatch of the Radiation Monitoring Team, totaling up to 13 specialists who have been making measurements mainly in Fukushima since 19 March
- (2) the dispatch of one marine expert from the IAEA's laboratories in Monaco, who was on board the Research Vessel "MIRAI" 2 -4 April to observe and provide advice to Japanese experts on their collection and analysis of seawater samples
- (3) the dispatch of the Joint FAO/IAEA Food Safety Assessment Team, who met with local government officials, farmers etc. in Ibaraki, Tochigi and Gunma prefectures. In addition, the IAEA experts in BWR technology arrived in Japan, met with the Japanese counterparts including TEPCO and visited the Fukushima Dai-ichi site on 7 April.

3. Speedy Dissemination of Accurate Information

- Japan is committed to the speedy dissemination of accurate information.
- All necessary information can be found at the following websites.

Japan's Countermeasures

- 1.http://www.kantei.go.jp/foreign/incident/index.html
- 2.http://www.meti.go.jp/english/index.html
- 3.<u>http://www.nisa.meti.go.jp/english/</u>

Measurement of Radioactivity Level

- 1.http://www.mext.go.jp/english/radioactivity_level/detail/1303962.htm
- 2.http://www.nisa.meti.go.jp/english/
- 3.<u>http://www.worldvillage.org/fia/kinkyu_english.php</u>
- 4. http://www.tepco.co.jp/en/press/corp-com/release/index-e.html

Drinking Water Safety

- 1.http://www.mhlw.go.jp/english/topics/2011eq/index.html
- 2.<u>http://www.waterworks.metro.tokyo.jp/press/shinsai22/press110324-02-1e.pdf</u>

Food Safety

- 1.http://www.maff.go.jp/e/index.html
- 2.<u>http://www.mhlw.go.jp/english/topics/2011eq/index.html</u>

Ports and Airports Safety

- 1.http://www.mlit.go.jp/page/kanbo01_hy_001428.html
- 2.http://www.mlit.go.jp/koku/flyjapan_en/index.html
- 3.http://www.mlit.go.jp/page/kanbo01 hy 001411.html