Japan's Challenges Towards Recovery

May 13, 2011

Ministry of Economy, Trade and Industry
Government of Japan

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

1. Damage

2. Rescue Efforts and Foreign Assistance

3. Nuclear Power Stations

Great Support of the International Community

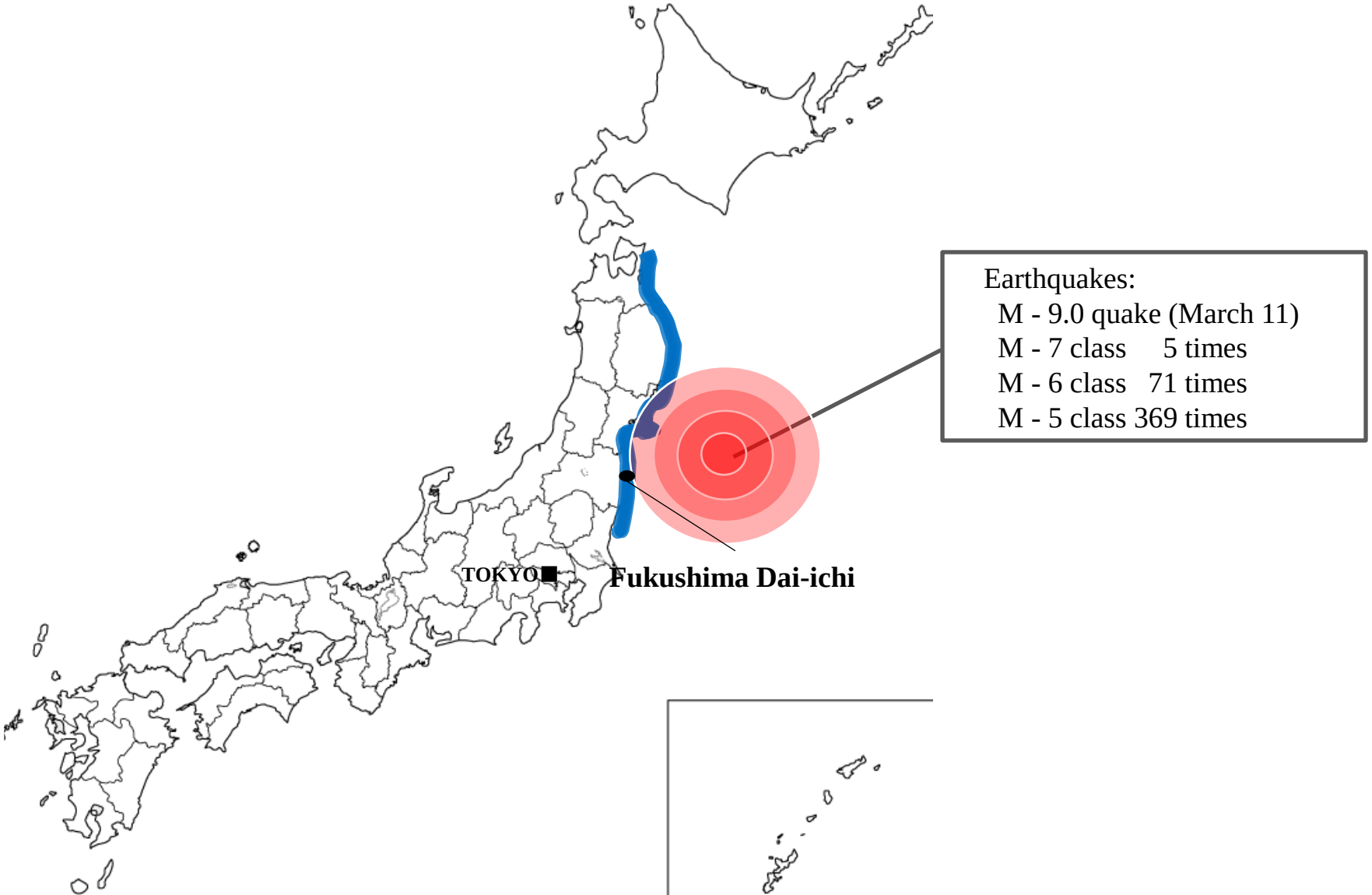
Japan deeply appreciates the assistance offered from

146 countries and regions and
39 international organizations

Rescue teams were sent from 26 countries, regions and international organizations

US Navy/US Pacific Command
(Operation Tomodachi)

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



1. Damage

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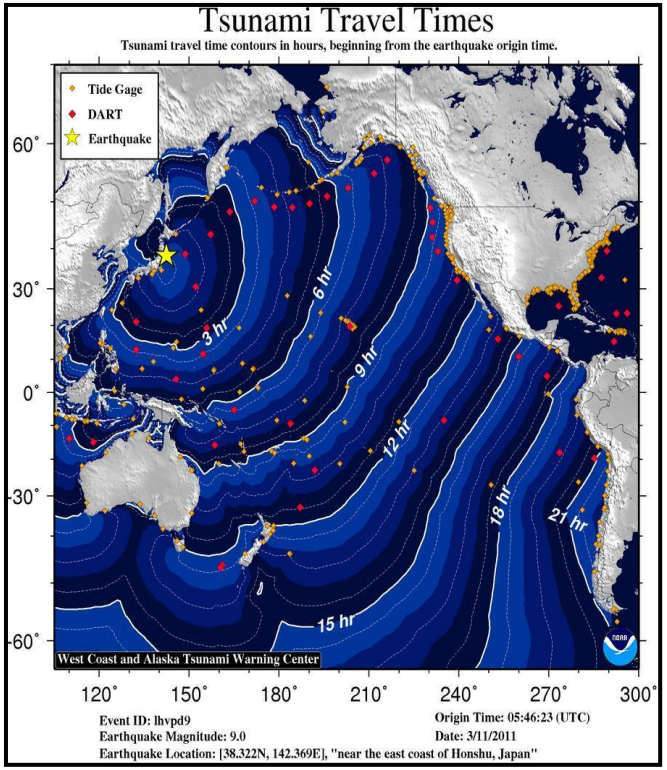
Casualties : over 30,000

- Dead over 14,000
- Missing over 9,000

Evacuees : over 150,000

(As of May 9th)



NOAA/US Dept of Commerce, http://wcatwc.arh.noaa.gov/

2. Rescue Efforts and Foreign Assistance

KYODO NEWS

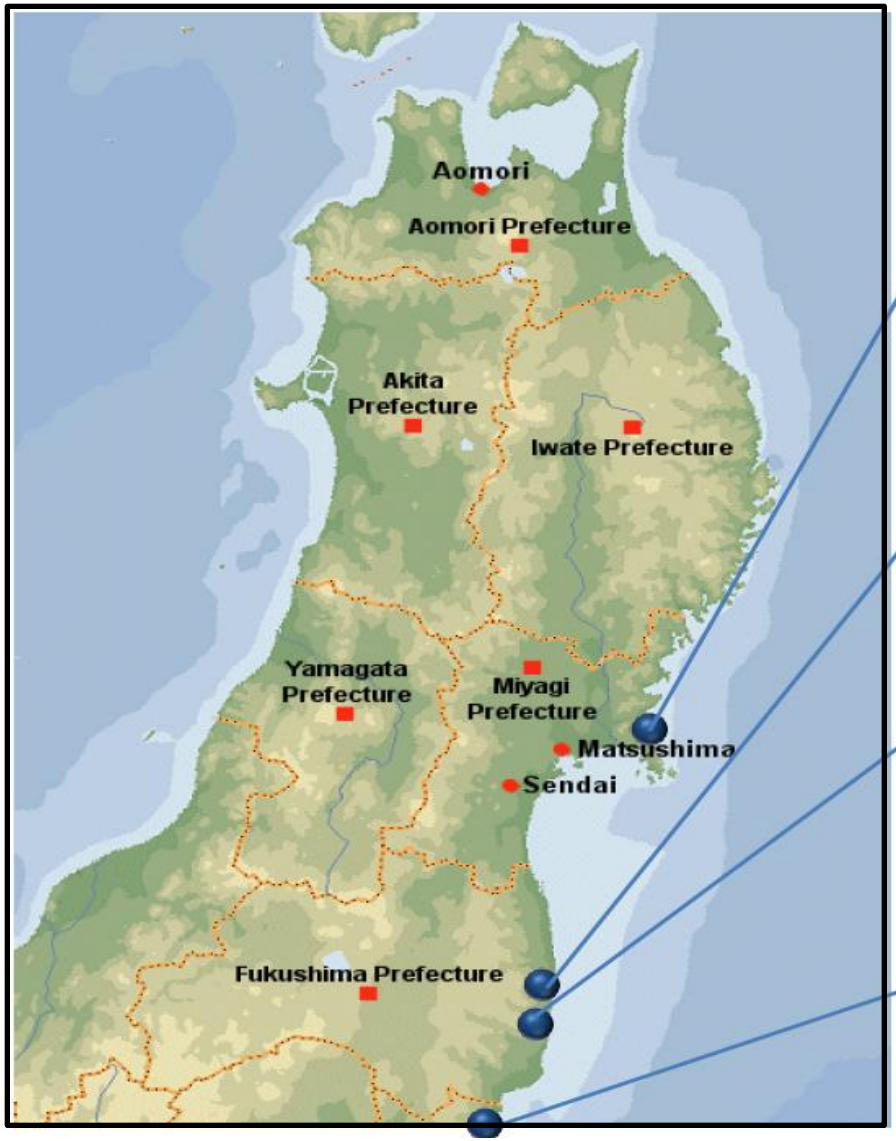
Ministry of Defense

Ministry of Defense

Ministry of Defense

3. Nuclear Power Stations
Nuclear Reactors near Epicenter of the Earthquake

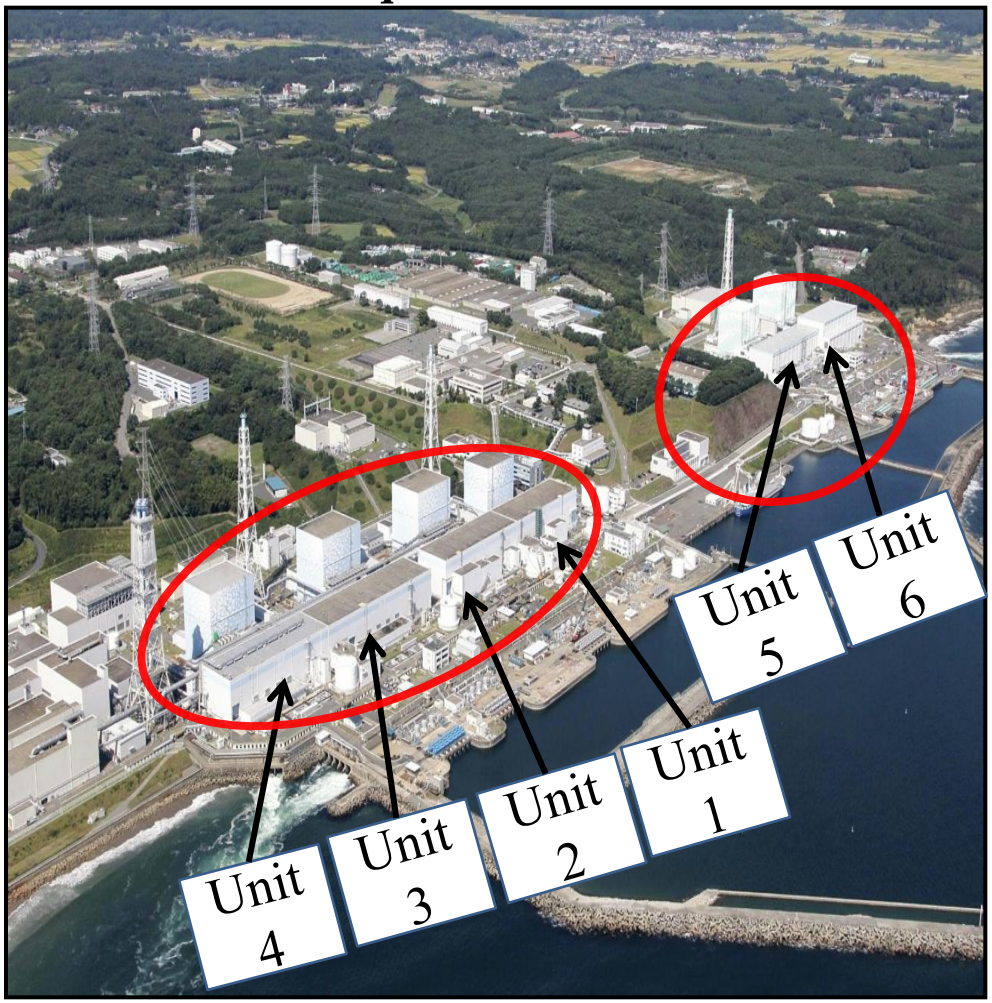
4 Nuclear Power Stations with 14 Units



		automatic shut down	cold shut down
Onagawa			
Unit 1	524 MW, 1984-	✓	✓
Unit 2	825 MW, 1995-	✓	✓
Unit 3	825 MW, 2002-	✓	✓
Fukushima Dai-ichi			
Unit 1	460 MW, 1971-	✓	
Unit 2	784 MW, 1974-	✓	
Unit 3	784 MW, 1976-	✓	
Unit 4	784 MW, 1978-	Periodical inspection	
Unit 5	784 MW, 1978-		✓
Unit 6	1,100 MW, 1979-		✓
Fukushima Dai-ni			
Unit 1	1,100 MW, 1982-	✓	✓
Unit 2	1,100 MW, 1984-	✓	✓
Unit 3	1,100 MW, 1985-	✓	✓
Unit 4	1,100 MW, 1987-	✓	✓
Tokai Dai-ni			
Unit 1	1,100 MW, 1978-	✓	✓

3. Nuclear Power Stations
Fukushima Dai-ichi Nuclear Power Station

Before the Earthquake and Tsunamis



TEPCO

After the Earthquake and Tsunamis

Air Photo Service Inc (Myoko, Niigata Japan)

3. Nuclear Power Stations
Fukushima Dai-ichi Nuclear Power Station

Cause of the Damage

Grid Line

① **Loss of off-site power due to the earthquake**

Reactor Building

About 40M

About 20M

Turbine Building

Diesel Generator

② **Diesel generator inoperable due to the tsunami**

All motor operated pumps including ECCS became inoperable

Huge Tsunami

GE Hitachi Nuclear Energy

Tsunami (estimated 14m)

Elevation: about 10m

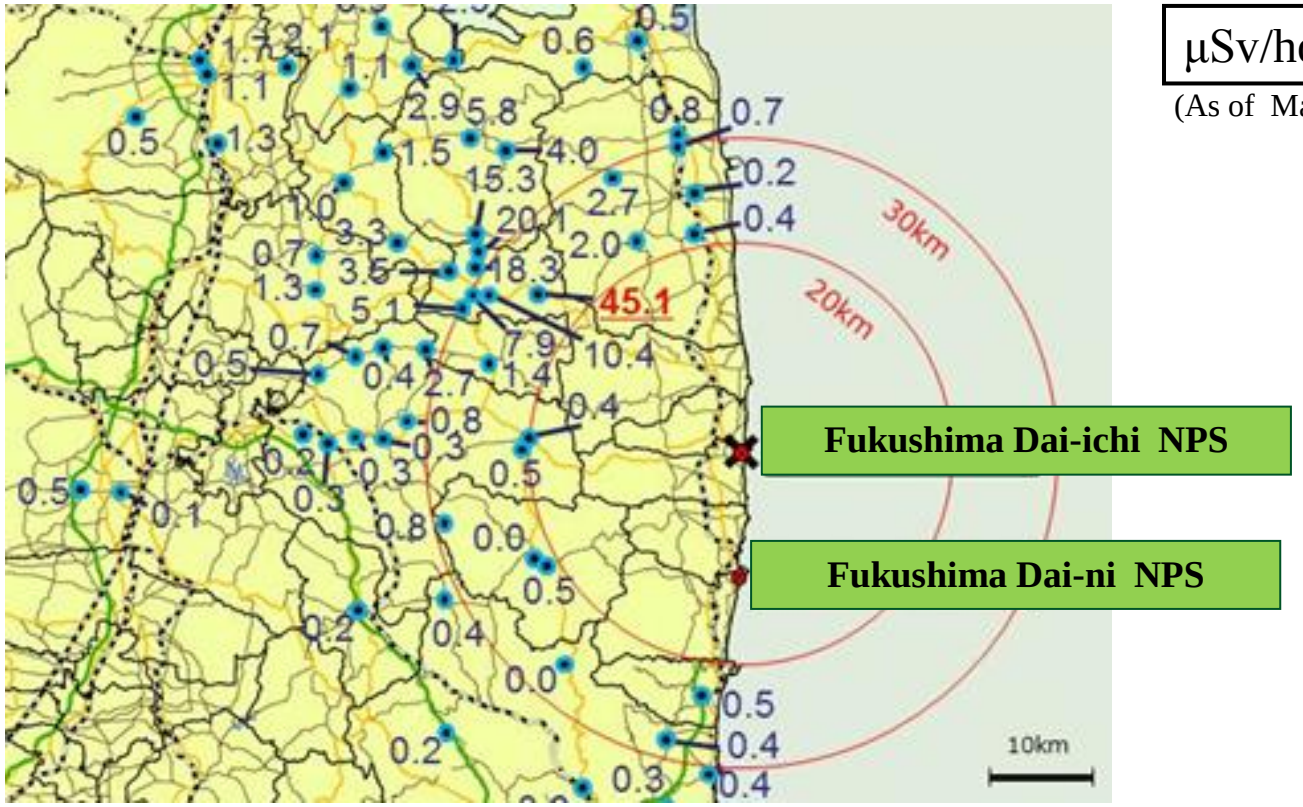
Breakwater

5.4 ~5.7m

Seawater level

Seawater Pump

3. Nuclear Power Stations
Fukushima Dai-ichi Nuclear Power Station



20 km radius of the plant and other designated areas
→ no-entry zone, planned evacuation zone

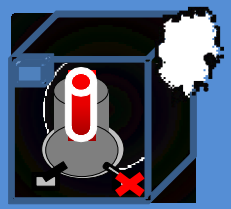
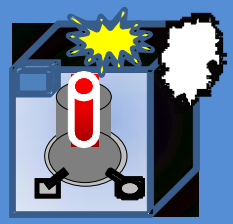
Other areas of the 30km radius of the plant (as a general rule)
→ emergency evacuation preparation area

B. Key Challenges

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

1. Cool Down of the Reactors

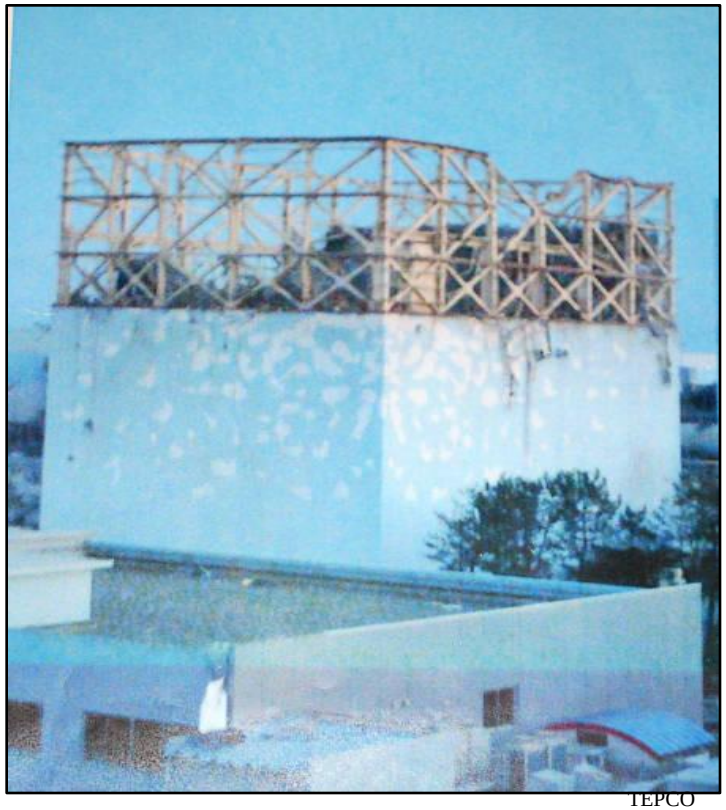
(As of May 9th)

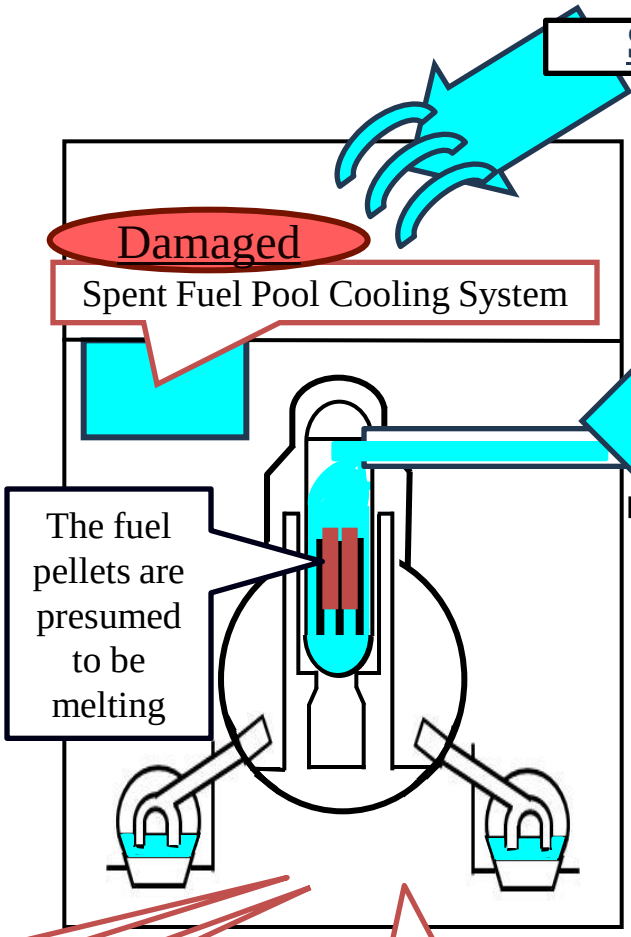
		Unit 1	Unit 2	Unit 3	Unit 4
					
Type / MW / Commercial Operation		BWR / 460 / Mar 71-	BWR / 784 / Jul 74-	BWR / 784 / Mar 76-	BWR / 784 / Oct 78-
Status at time of Earthquake		In Operation	In Operation	In Operation	Periodical Inspection Outage
	Automatic Shutdown	✔	✔	✔	—
RPV	Fresh Water Injection	✔	✔	✔	—
	Water Level [mm] (distance from the top of fuel)	-1,650 (A) -1,700 (B)	-1,500 (A) -2,100 (B)	-2,100(A) -2,150 (B)	—
	Reactor Pressure [Mpa]	0.561 (A)* 1.401 (B)*	0.078 (A)* 0.081 (D)*	0.016 (A)* 0.01 (C)*	—
	Temperature — Feedwater Nozzle — Bottom Head of RPV	115.8℃* 95.4 ℃	115.6℃ N/A	210.4 ℃* 153 ℃	—
SFP	Fresh Water Injection	✔	✔	✔	✔
	Temperature	-	47℃	-	-
Building		Damage	Slight Damage	Damage	Damage
AC Power (Lighting of Central Operation Room**)		✔	✔	✔	✔

*Under monitoring of the change of the situation.

1. Cool Down of the Reactors (Unit 1)

(As of May 9th)





■**Fuel Bundle**
- 400

■**Spent Fuel in the Pool**
- 292 + 100 (new)

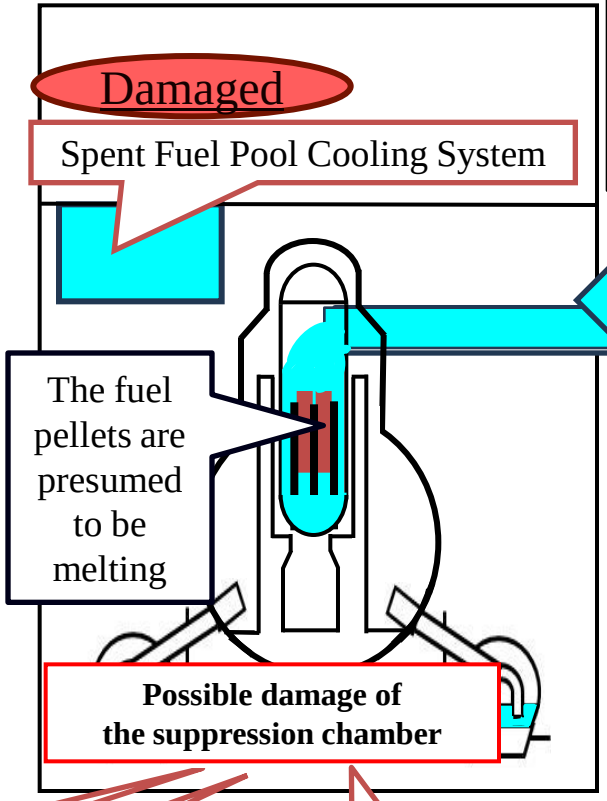
■**Major Events**

- Mar.12 - Venting started
- Mar.12 - Hydrogen explosion
- Mar.12 - Seawater injection to reactor core
- Mar.25 - Fresh water injection to reactor core
- Mar.29 - Fresh water injection using electrical pump
- Mar.31 - Fresh water spray by concrete pump trucks to spent fuel pool
- Apr. 7 - Injection of nitrogen to the primary containment vessel

1. Cool Down of the Reactors (Unit 2)

(As of May 9th)

Ministry of Defense



■**Fuel Bundle**
- 548

■**Spent Fuel in the Pool**
- 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
- Mar.20 - Seawater injection to spen fuel pool (SFP)
- Mar.26 - Fresh water injection to reactor core
- Mar.27- Fresh water injection using electrical pump
- Mar.29 - Fresh water injection to SFP

Damaged

Emergency Diesel Generator

Residual Heat Removal System

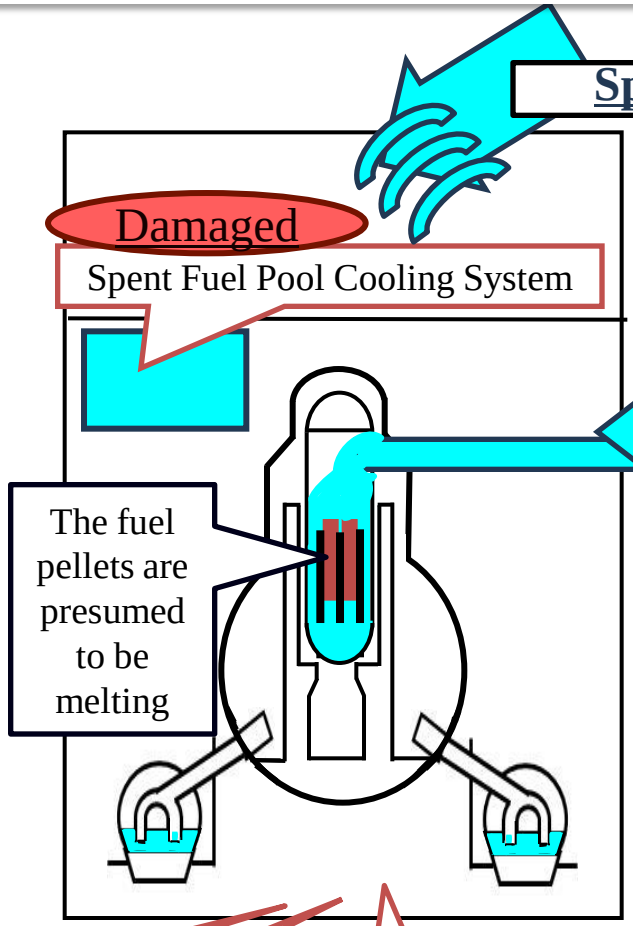
Recovered

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

1. Cool Down of the Reactors (Unit 3)

(As of May 9th)

Air Photo Service Inc (Myoko, Niigata Japan)



■**Fuel Bundle**
- 548

■**Spent Fuel in the Pool**
- 514 + 52 (new)

Injecting fresh water or seawater

■**Major Events**
- Mar.13 - Venting started
- Mar.13 - Seawater injection to reactor core
- Mar.14 - Hydrogen explosion
- Mar.20 - Sprayed to spent fuel pool (SFP) by Tokyo Fire Department
- Mar.25 - Fresh water injection to reactor core
- Mar. 28- Fresh water injection using electrical pump
- Mar.29~ Fresh water spray by concrete pump trucks to SFP

Damaged

Recovered

Emergency Diesel Generator

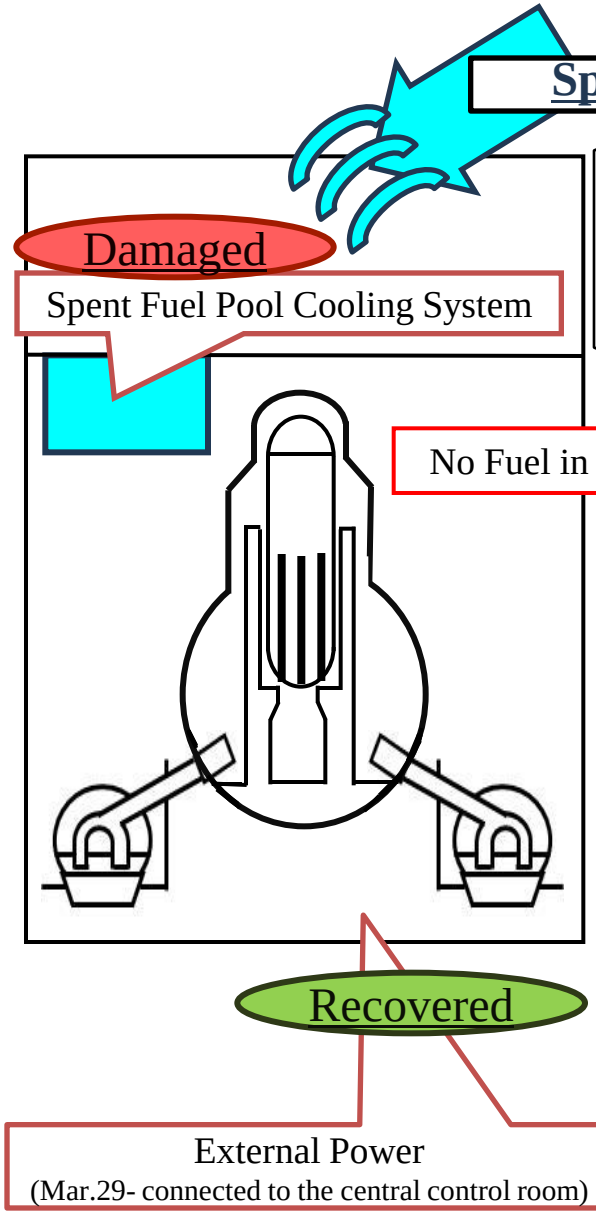
Residual Heat Removal System

External Power
(Mar.22- connected to the central control room)

1. Cool Down of the Reactors (Unit 4)

(As of May 9th)

Air Photo Service Inc (Myoko, Niigata Japan)



■**Fuel Bundle**
- 0

■**Spent Fuel in the Pool**
- 1331 + 204 (new)

No Fuel in Reactor Pressure Vessel

■**Major Events**

- Mar.15 - Fire occurred
- Mar.16 - Fire occurred
- Mar.20 - Seawater spray by Self- Defense Forces to spent fuel pool (SFP)
- Mar.25 - Seawater injection to SFP
- Mar.30 - Fresh water spray by concrete pump trucks to SFP

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

(As of May 9th)

■**Fuel Bundle**
- Unit5 : 548

■**Spent Fuel in the Pool**
- Unit 5 : 946 + 48 (new)

■**Fuel Bundle**
- Unit6 : 764

■**Spent Fuel in the Pool**
- Unit 6: 876 + 64 (new)

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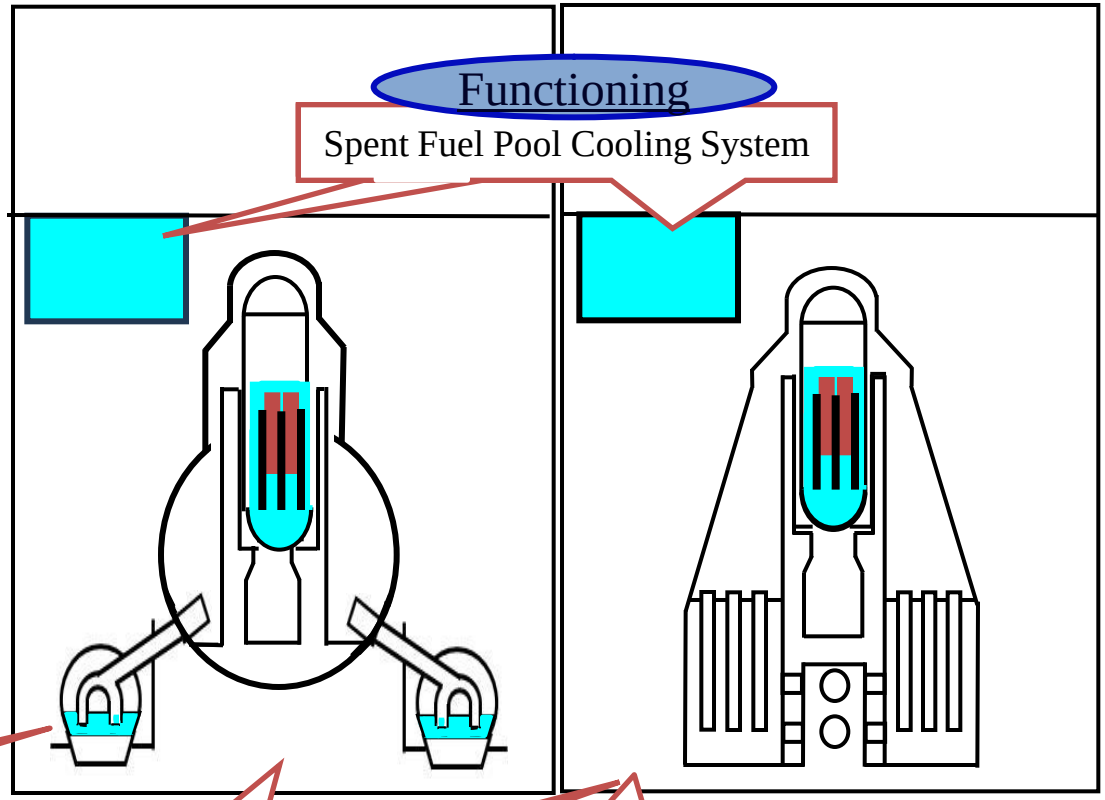


Functioning

External Power [Unit 5]

Emergency Diesel Generator

Residual Heat Removal System

Recovered

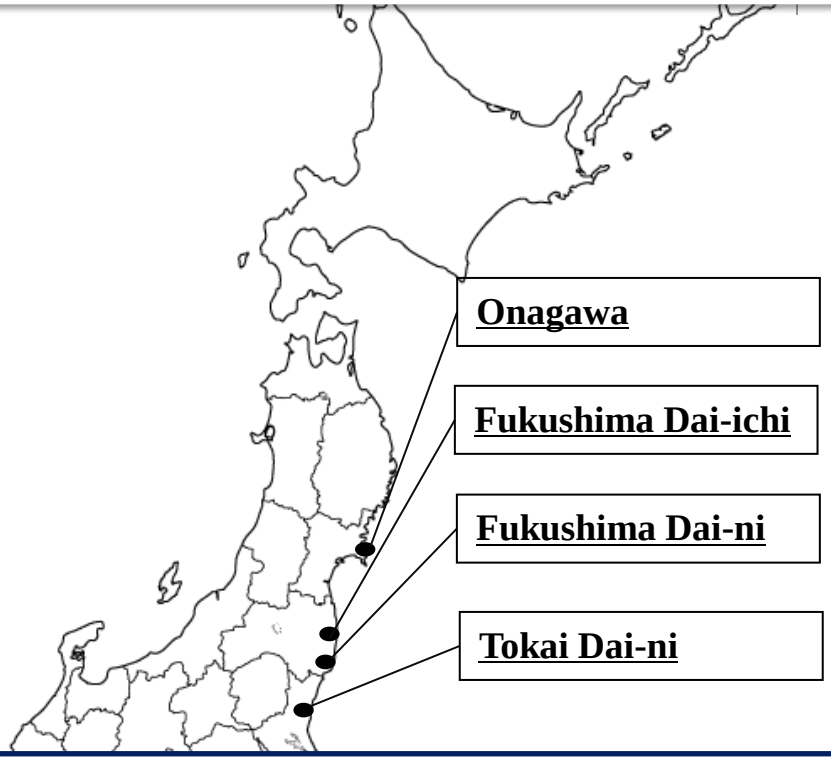
External Power [Unit 6]
(Mar.22- connected to the central control room)

Other Nuclear Power Stations in the Tohoku Area

Onagawa (3 Units)

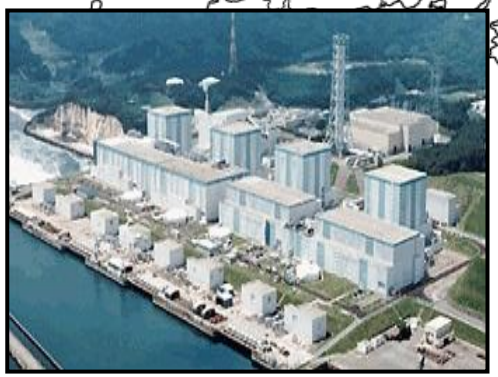
Tohoku Electric Power Co., Inc

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



Fukushima Dai-ni (4 Units)

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



TEPCO

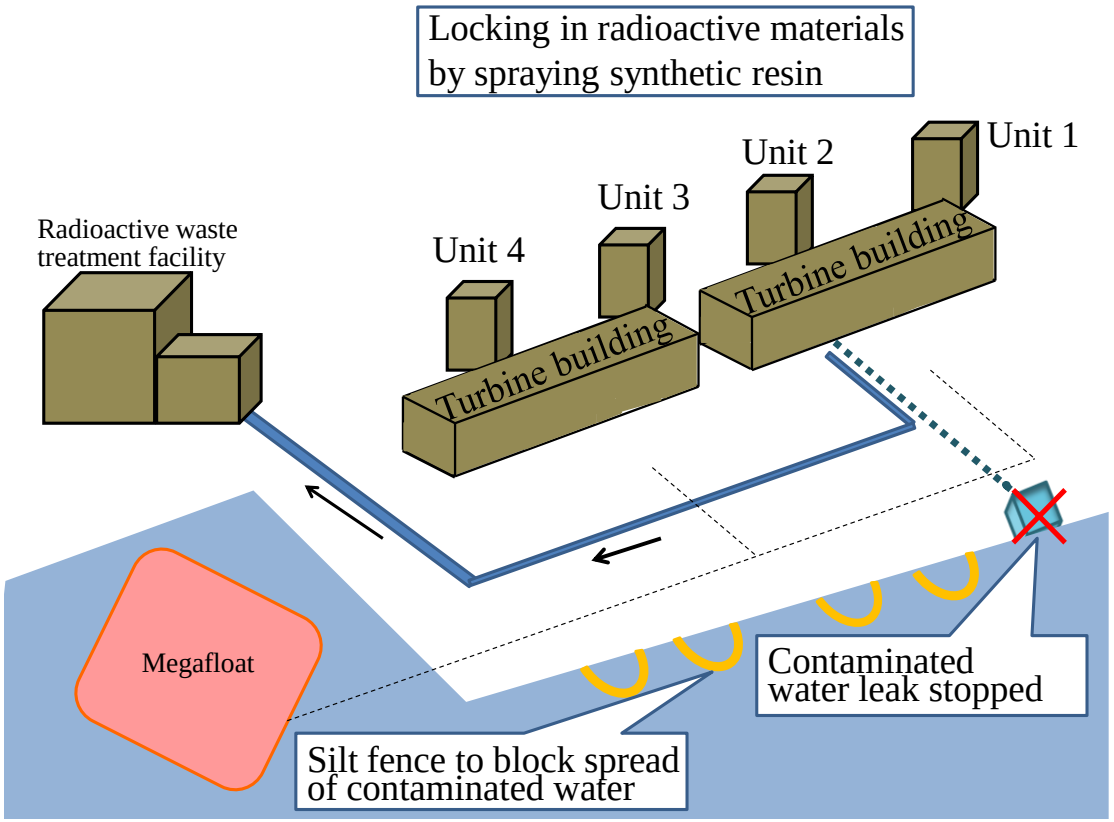
Tokai Dai-ni (1 Unit)

The unit was immediately shut down automatically, then safely went to cold shut down.

The Japan Atomic Power Company

Contain the Spread of Radioactive Substances
(sea, soil and atmosphere)

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



■Major Events

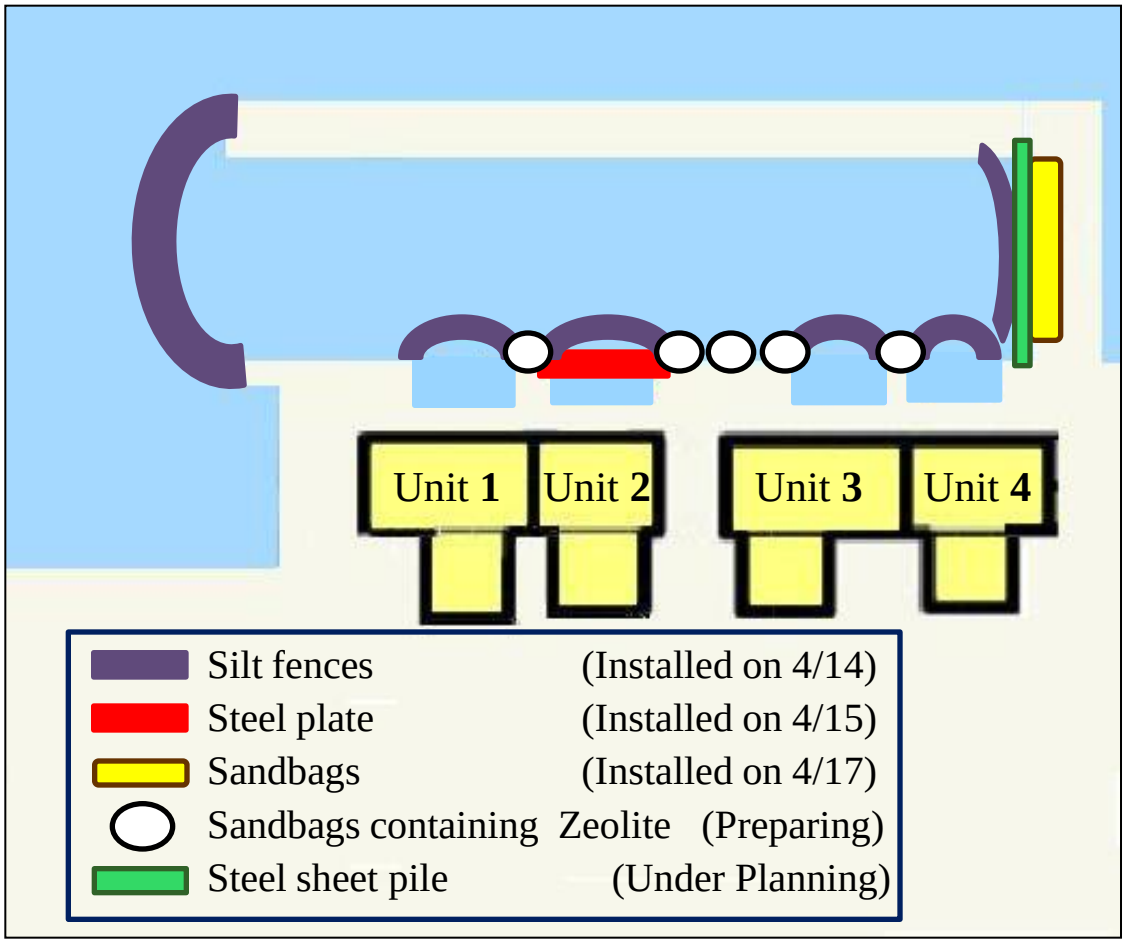
- Apr. 2
  Highly contaminated water discovered leaking into the sea.
- Apr. 6
  Leak of contaminated water into the sea was stopped.
- Apr. 12
  Transfer of stagnant water in the trench of Unit2 to the condenser started.
- Apr. 14
  Silt fence was installed to block the spread of contaminated water.
- Apr. 19
  Transfer of stagnant water in the trench of Unit 2 to the radioactive waste treatment facilities started.

2. Contain the Spread of Radioactive Substances

(Preventing the Spread of Water)

(As of May 7th)

Silt fences, steel plates, and sandbags with radioactive-substance absorption material have been installed to contain the spread of radioactive water. The Japanese Government and TEPCO carefully monitor seawater.

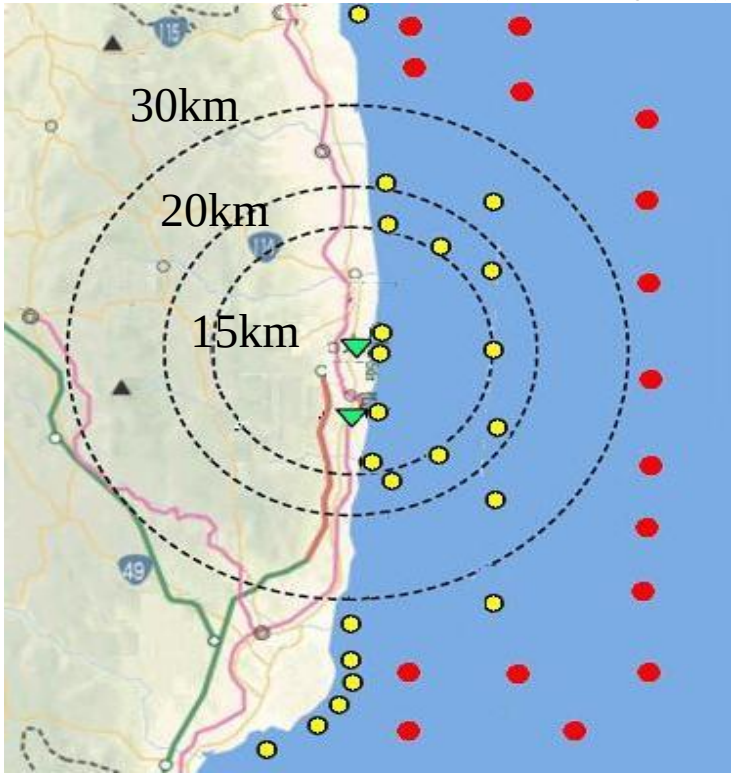


○ : Monitoring Locations by TEPCO

● : Monitoring Locations by MEXT

(Ministry of Education, Culture, Sports, Science and Technology)

(As of May 7th)



2. Contain the Spread of Radioactive Substances
(sea, soil and atmosphere)

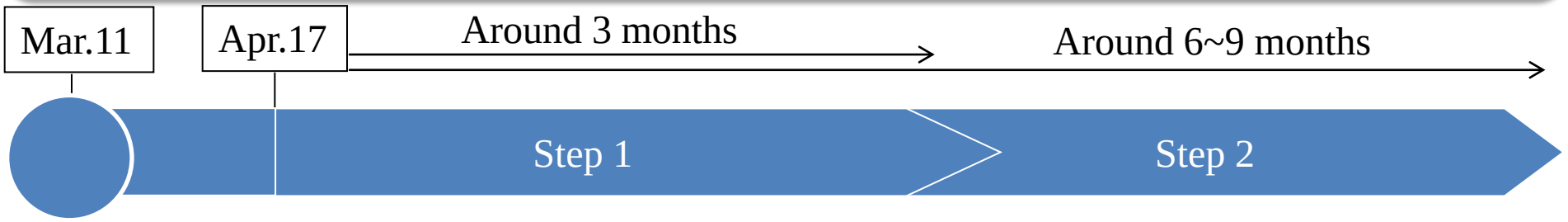
Experts are making the utmost efforts to prevent dispersing radioactive substances contained in dust, debris and vapor.

Spraying synthetic materials on the surface of the ground and debris to prevent radioactive substances dispersion

TEPCO

Roadmap towards Restoration from the Accident

(announced by TEPCO on Apr.17)

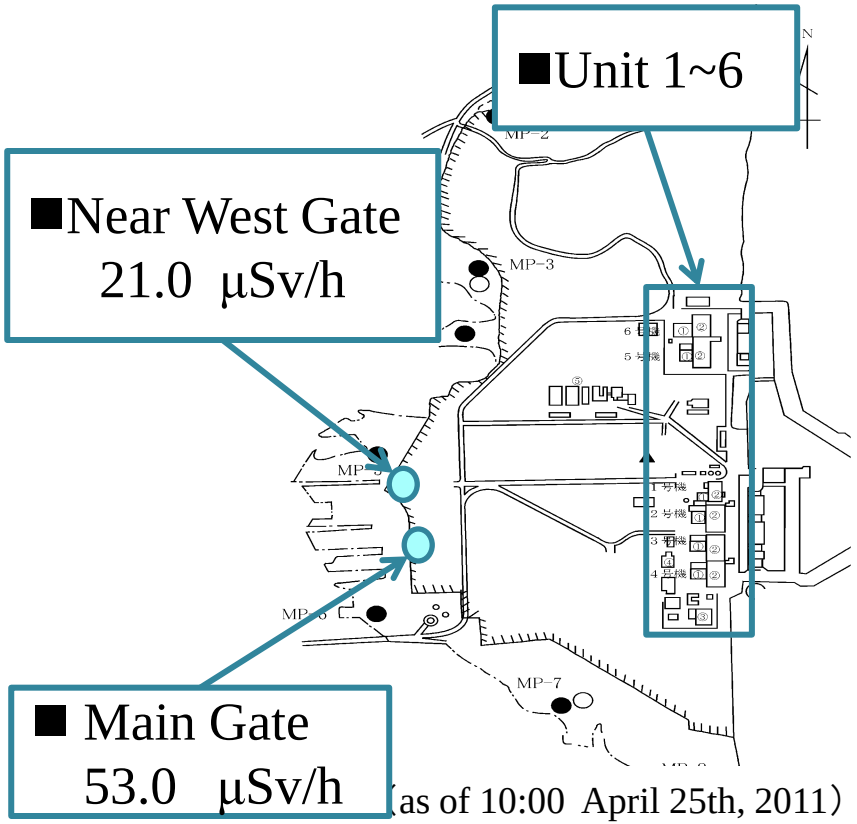


Target	Radiation dose in steady decline	Controlling release of radioactive materials (significant reduction of dose level)
[Reactors]	Stable cooling - Resume heat exchange function - [Unit 1,3] flood up to top of active fuel - [Unit 2] Seal the damaged location	Achieve cold shutdown
[Spent Fuel Pools]	Stable cooling - Enhance reliability of water injection - Restore coolant circulation system - [Unit 4] Install supporting structure	More stable cooling - Keep sufficient level of water by remote-control - Resume heat exchange function
[Contaminated Water]	Secure storage place - Prevention of outflow to the outside of the site	Decrease contaminated water (decontamination and desalt)
[Contaminated Atmosphere/Soil]	Prevention of spread	Install reactor building cover

3. Rigorous and Intensive Monitoring

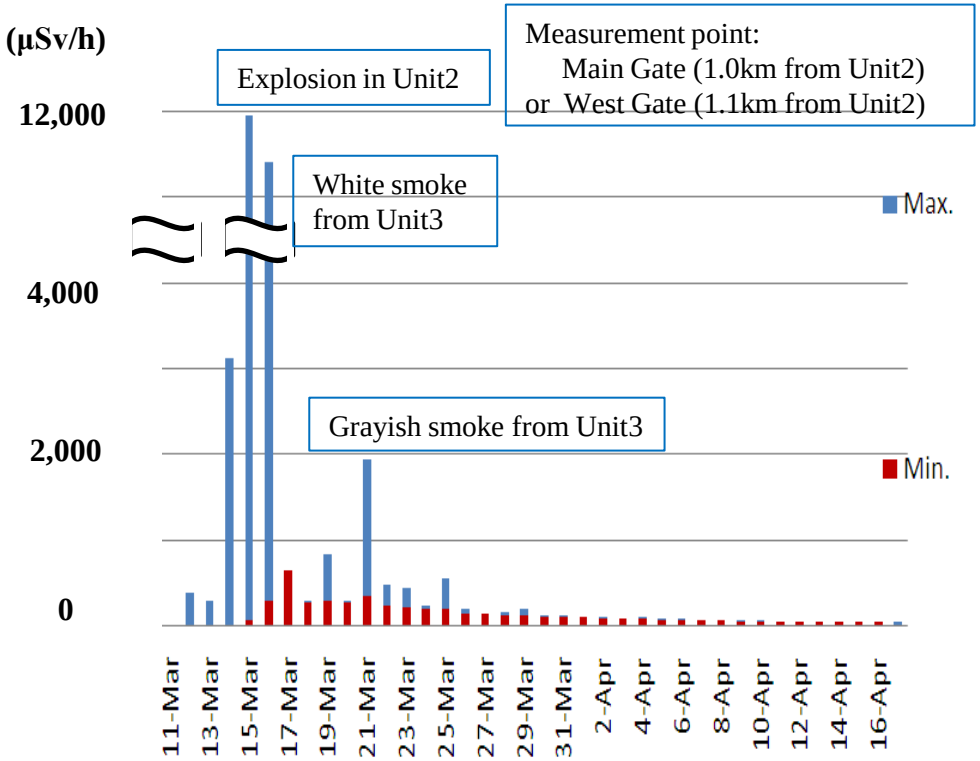
TEPCO monitors radioactivity levels every 10 minutes and releases the results immediately. Radioactivity levels rose on March 15th, but have since fallen and remain low.

Monitoring posts and the readings at the Fukushima Dai-ichi NPS

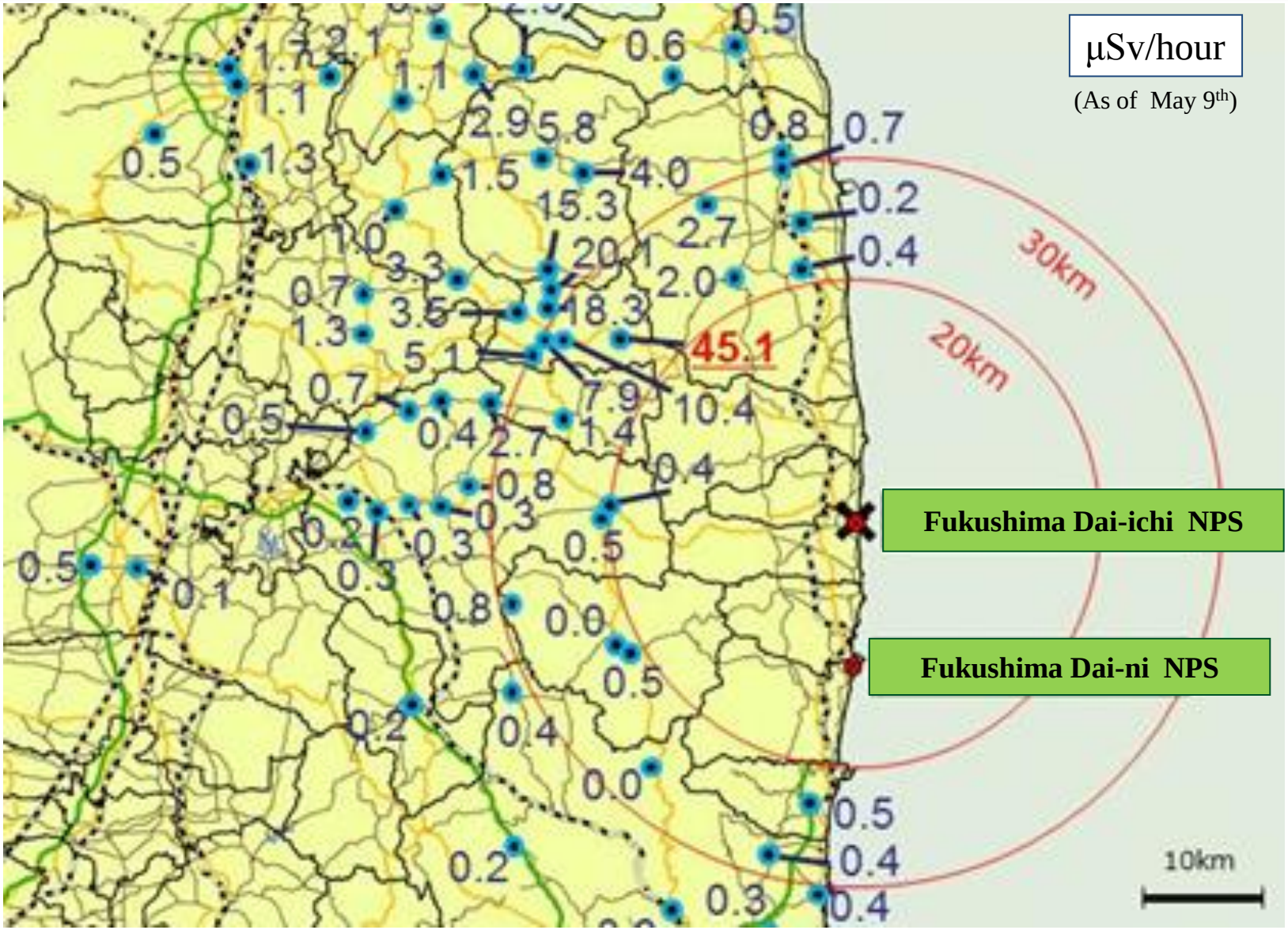


（as of 10:00 April 25th, 2011）

Environmental Radioactivity Level at the Fukushima Dai-ichi NPS

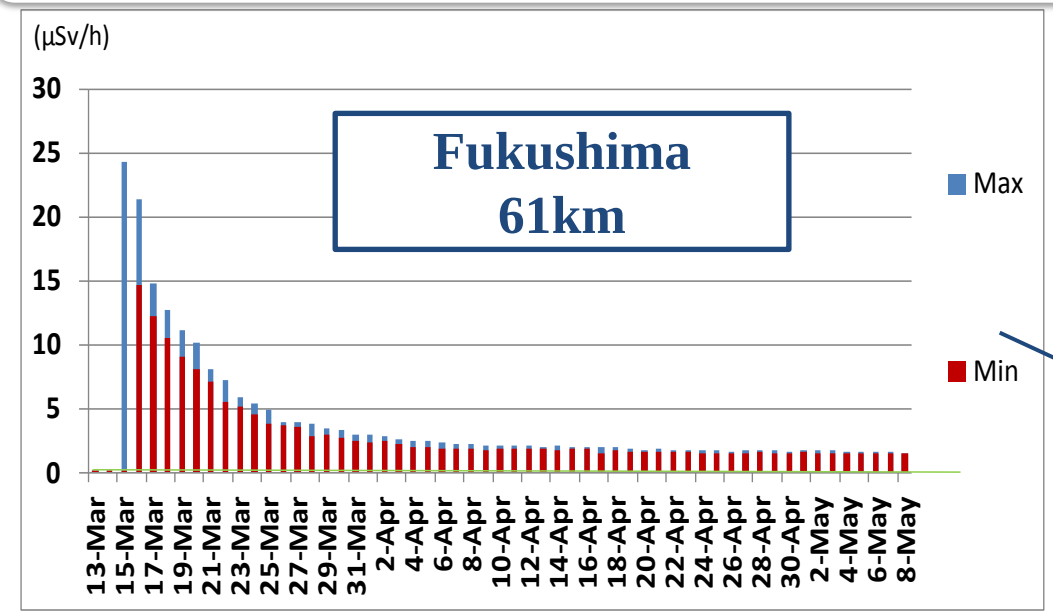


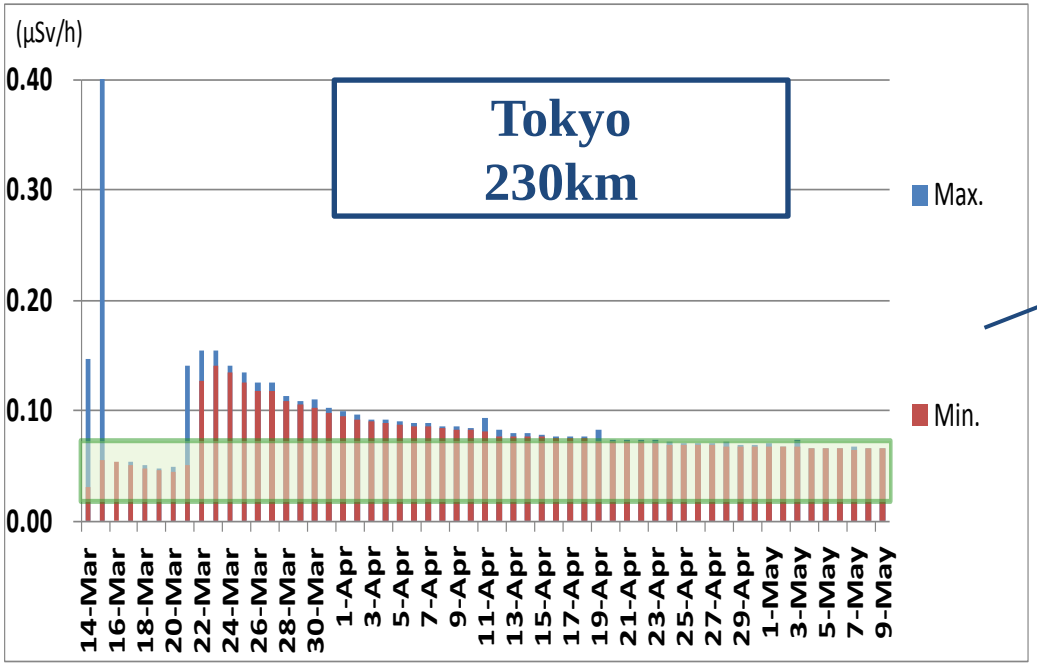
Readings at Monitoring Posts out of Fukushima Dai-ichi NPS



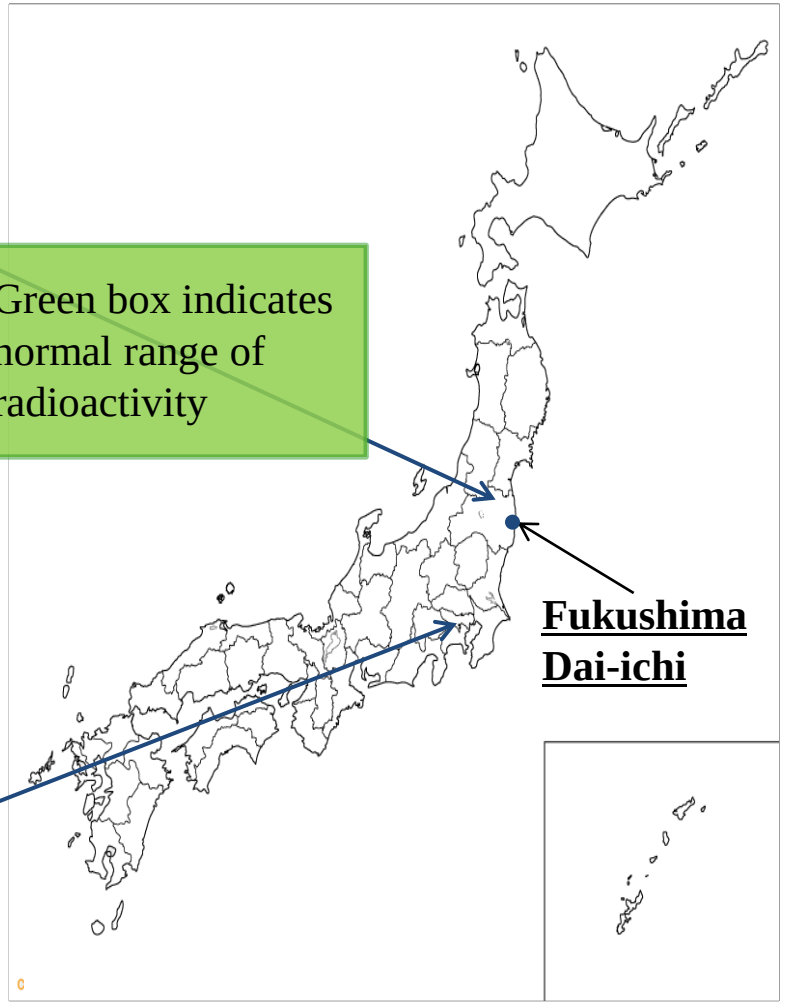
Ministry of Education, Culture, Sports, Science and Technology (MEXT)

Atmospheric Readings



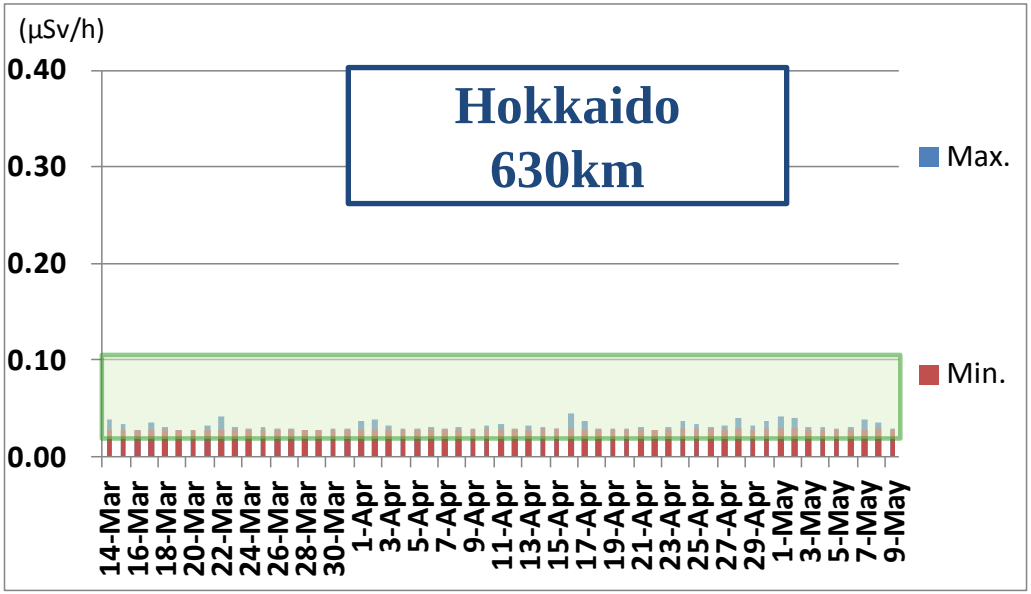


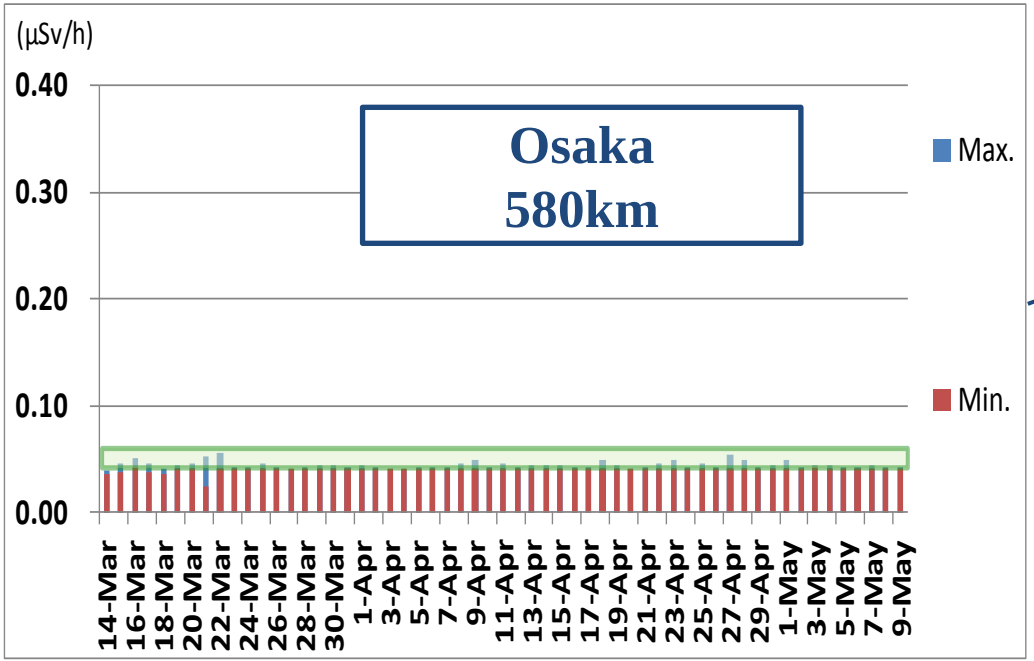
Green box indicates normal range of radioactivity

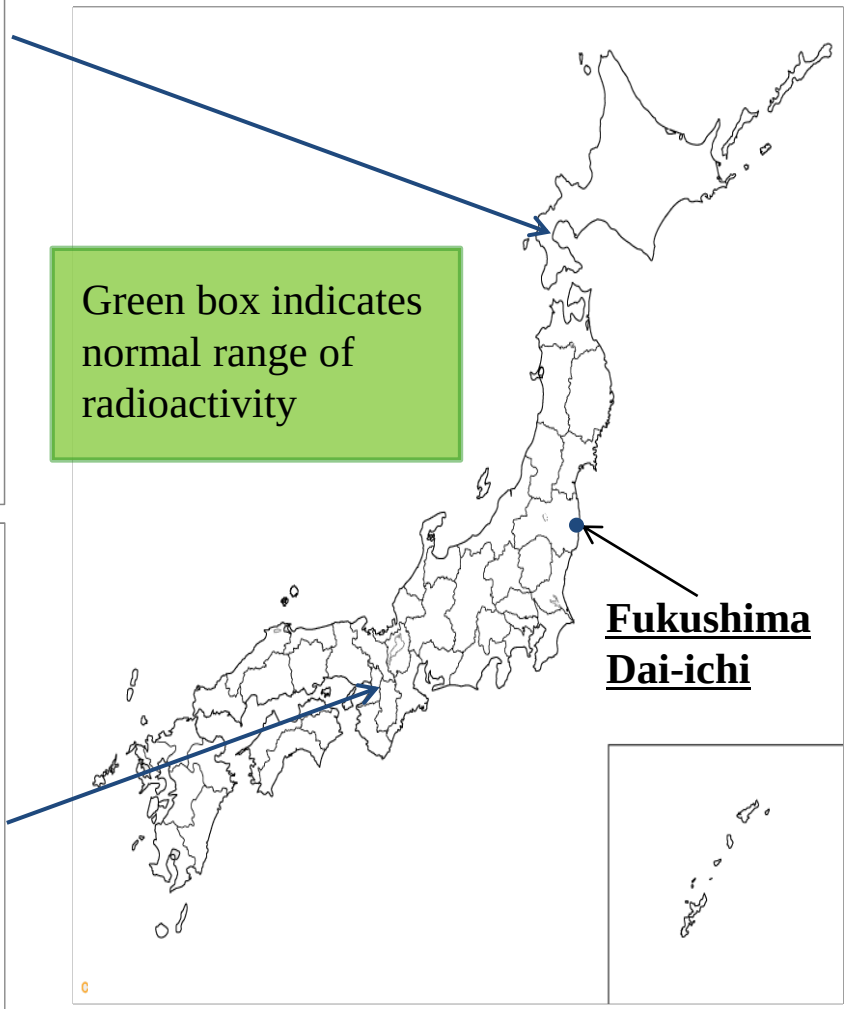


MEXT, Fukushima Prefectural Government

Atmospheric Readings



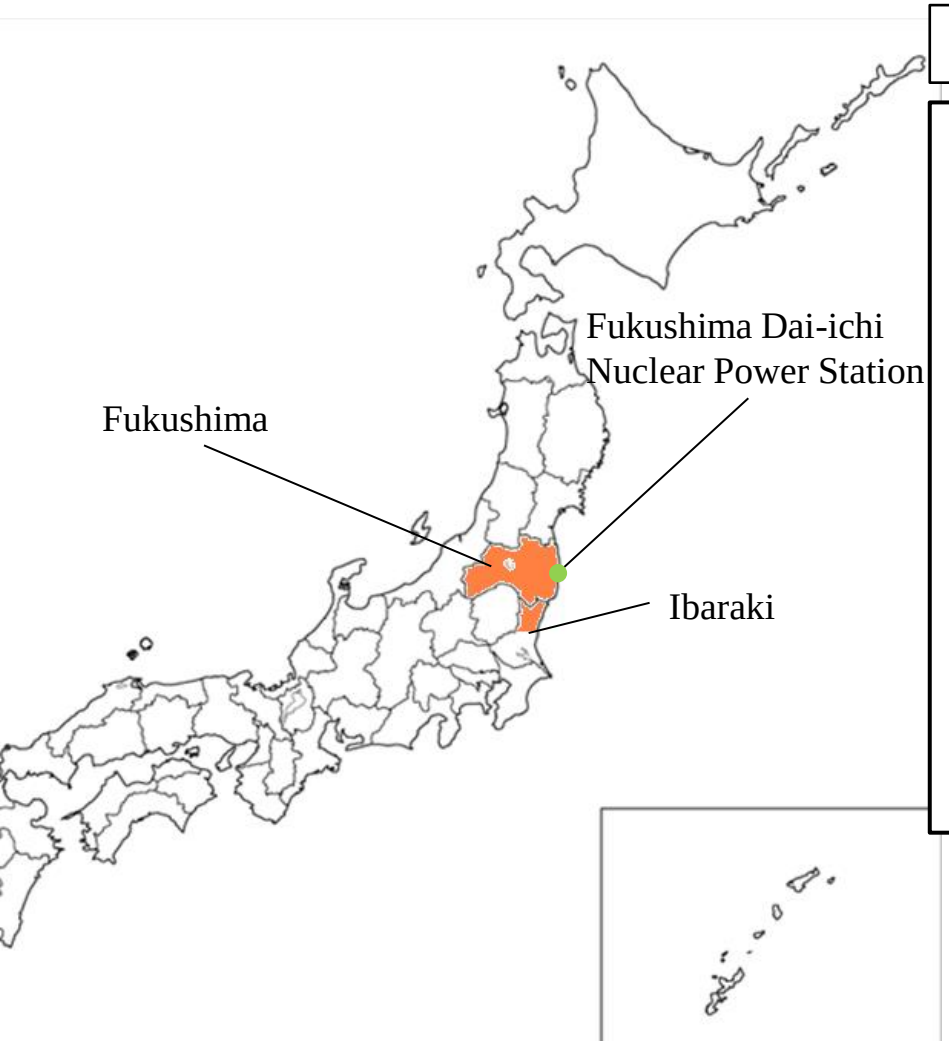




MEXT, Fukushima Prefectural Government

4. Ensure the Safety of Food, Products, On-site Workers, Ports and Airports
Safety of Food

Japan inspects radioactivity in food every day, and restricts distribution of food that fails to meet provisional regulation values taking into consideration the spread of contamination.



Instructions (as of 9 May 2011)

… Not to Distribute

*** Fukushima Prefecture**

- Raw milk
- Non-head type leafy vegetables (e.g. spinach)
- Head type leafy vegetables (e.g. cabbage)
- Flowerhead brassicas (e.g. broccoli, cauliflower)
- Turnip
- Log grown shiitake (grown outdoor)
- Bamboo shoot
- Ostrich fern
- Juvenile (baby) fish of Japanese sand lance

*** Ibaraki Prefecture**

- Spinach

Please refer to the next slide for the details of the Instructions.

Source: Ministry of Health, Labour and Welfare

The instructions associated with food by Director-General of the Nuclear Emergency Response Headquarters

as of 9 May 2011

			Restriction of distribution			
			Fukushima		Ibaraki	
			Whole area	Individual areas	Whole area	Individual areas
raw milk			***3/21～ (excluding areas listed on the right cells)***	3/21～4/8 Kitakata-shi, Bandai-machi, Inawashiro-machi, Mishima-machi, Aizumisato-machi, Shimogo-machi, Minamiaizu-machi 3/21～4/16 Fukushima-shi, Nihonmatsu-shi, Date-shi, Motomiya-shi, Kunimi-machi, Otama-mura, Koriyama-shi, Sukagawa-shi, Tamura-shi(excluding miyakoji area), Miharu-machi, Ono-machi, Kagamiishi-machi, Ishikawa-machi, Asakawa-machi, Hirata-mura, Furudono-machi, Shirakawa-shi, Yabuki-machi, Izumizaki-mura, Nakajima-mura, Nishigo-mura, Samekawa-mura, Hanawa-machi, Yamatsuri-machi, Iwaki-shi 3/21～4/21 Soma-shi, Shinchi-machi 3/21～5/1 Minamisoma-shi (limited to Kashima-ku excluding Karasuzaki, Ouchi, Kawago and Shionosaki area), Kawamata-machi (excluding Yamakiya area)	3/23～4/10	
Vegetable	non-head type leafy vegetables, e.g. spinach, komatsuna	spinach	***3/21～ (excluding areas listed on the right cell)***	3/21～5/4 Shirakawa-shi, Iwaki-shi, Yabuki-machi, Tanagura-machi, Yamatsuri-machi, Hanawa-machi, Nishigo-mura, Izumizaki-mura, Nakajima-mura, Samekawa-mura	3/21～4/17 (excluding areas listed on the right cell)	***3/21～ Kitaibaraki-shi、Takahagi-shi***
		kakina			3/21～4/17	
		garland chrysanthemum, qing-geng-cai, sanchu asian lettuce	***3/23～ (excluding areas listed on the right cell)***	3/23～5/4 Shirakawa-shi, Iwaki-shi, Yabuki-machi, Tanagura-machi, Yamatsuri-machi, Hanawa-machi, Nishigo-mura, Izumizaki-mura, Nakajima-mura, Samekawa-mura	-	
		all the other				
	head type leafy vegetables, e.g. cabbage		***3/23～ (excluding areas listed on the right cells)***	3/23～4/27 Aizuwakamatsu-shi, Bandai-machi, Inawashiro-machi, Kitakata-shi, Kitashiobara-mura, Nishiaizu-machi, Aizumisato-machi, Aizubange-machi, Yugawa-mura, Yanaizu-machi, Mishima-machi, Kaneyama-machi, Syouwa-mura, Minamiaizu-machi, Shimogou-machi, Hinoemata-mura, Tadami-machi 3/23～5/4 Koriyama-shi, Sukagawa-shi, Tamura-shi (excluding area within 20 km of the Fukushima Daiichi), Iwaki-shi, Kagamiishi-machi, Ishikawa-machi, Asakawa-machi, Furudono-machi, Miharu-machi, Ono-machi, Tenei-mura, Hirata-mura	-	
	flowerhead brassicas, e.g. broccoli, cauliflower		***3/23～ (excluding areas listed on the right cells)***	3/23～4/27 Shirakawa-shi, Yabuki-machi, Nishigou-mura, Izumizaki-mura, Nakajima-mura, Tanagura-machi, Yamatsuri-machi, Hanawa-machi, Samegawa-mura 3/23～5/4 Iwaki-shi	-	
	turnip		***3/23～ (excluding areas listed on the right cell)***	3/23～5/4 Fukushima-shi, Nihonmatsu-shi, Date-shi, Motomiya-shi, Koriyama-shi, Sukagawa-shi, Tamura-shi (excluding area within 20 km of the Fukushima Daiich), Iwaki-shi, Kori-machi, Kunimi-machi, Kawamata-machi (excluding Yamakiya area), Kagamiishi-machi, Ishikawa-machi, Asakawa-machi, Furudono-machi, Miharu-machi, Ono-machi, Otama-mura, Tenei-mura, Tamakawa-mura, Hirata-mura	-	
	parsley		-		3/23～4/17	
	celery		-		-	
	log-grown shiitake (grown outdoor)		-	***4/13～ Shinchi-machi, Date-shi, Iitate-mura, Soma-shi, Minamisoma-shi, Namie-machi, Futaba-machi, Okuma-machi, Tomioka-machi, Naraha-machi, Hirono-machi, Kawamata-machi, Katsurao-mura, Tamura-shi, Kawauchi-mura*** 4/13～25 Iwaki-shi ***4/18～ Fukushima-shi*** ***4/25～ Motomiya-shi***	-	
	bamboo shoot		-	***5/9～ Date-shi, Soma-shi, Iwaki-shi, Miharu-machi, Tenei-mura, Hirata-mura***	-	
	ostrich fern		-	***5/9～ Fukushima-shi, Kori-machi***	-	
Fishery product	sand lance (juvenile)		***4/20～***		-	

*** Instructions still imposed are expressed in Italic type.**

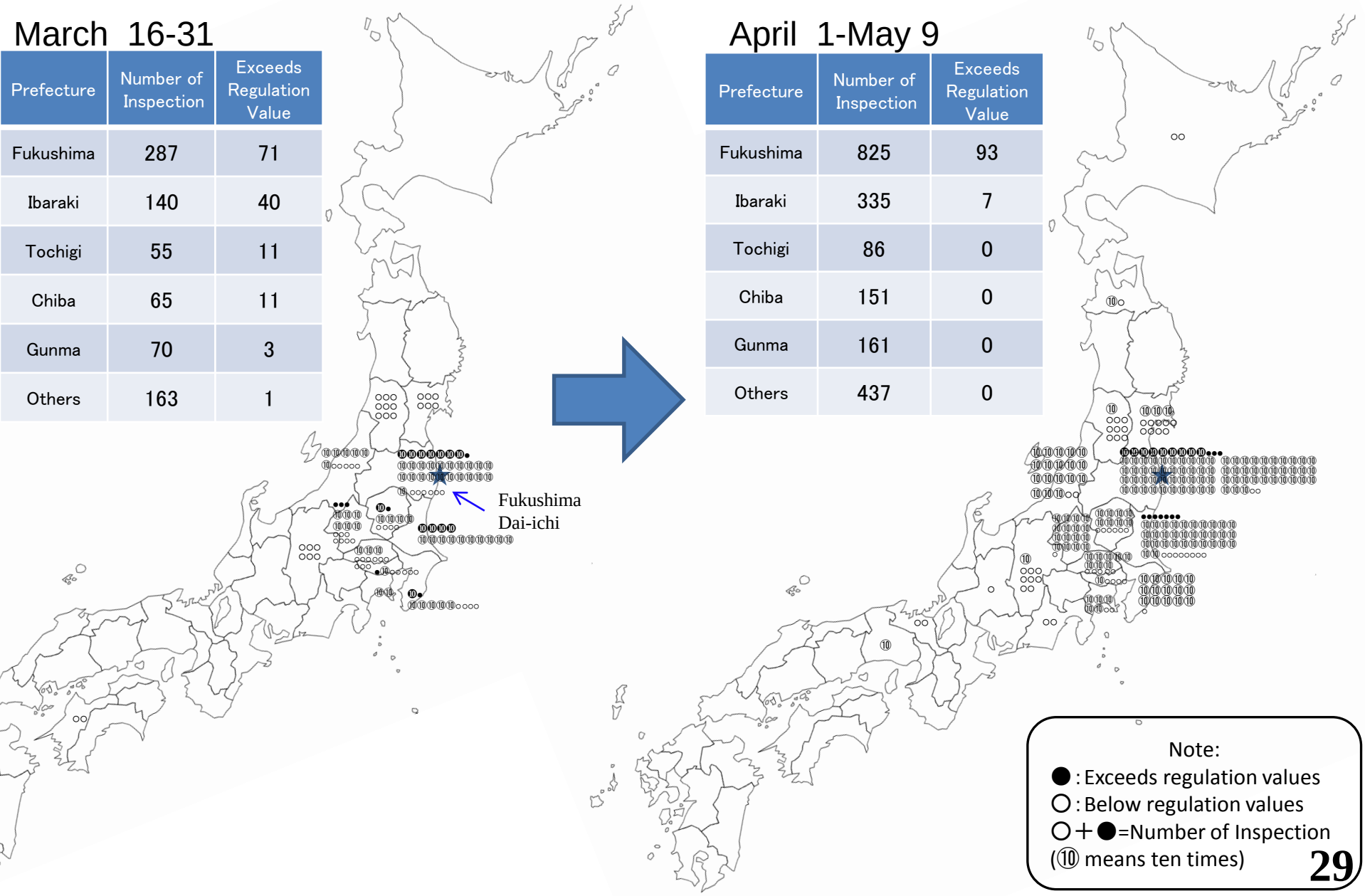
Test Result of Radionuclide in Fresh Produce

March 16-31

Prefecture	Number of Inspection	Exceeds Regulation Value
Fukushima	287	71
Ibaraki	140	40
Tochigi	55	11
Chiba	65	11
Gunma	70	3
Others	163	1

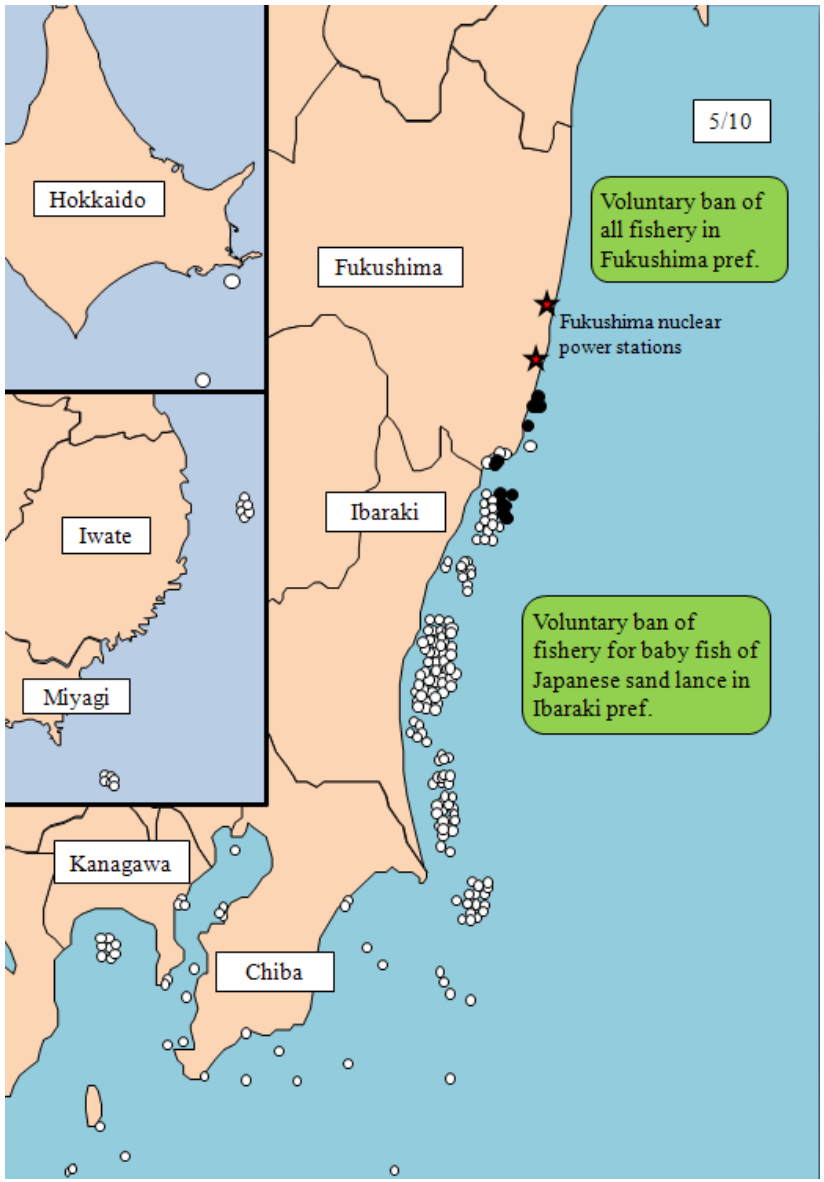
April 1-May 9

Prefecture	Number of Inspection	Exceeds Regulation Value
Fukushima	825	93
Ibaraki	335	7
Tochigi	86	0
Chiba	151	0
Gunma	161	0
Others	437	0



Note:
●: Exceeds regulation values
○: Below regulation values
○＋●=Number of Inspection
(⑩ means ten times)

Safety of Marine Food



● Over provisional regulation values: 12 samples
○ Below provisional regulation values: 227 samples

All 12 samples over provisional regulation values are Juvenile (baby) fish of "Japanese sand lance", which inhabits in very surface water influenced by radionuclides

Fisheries of this fish species are not conducted in Fukushima prefecture and Ibaraki prefecture

No fisheries are conducted in Fukushima prefecture

Safety of Industrial Products

- Japanese manufacturing industries spare no effort to ensure the safety of their products.
- Inspection institutions and industry associations provide testing service of the radiation levels of export products.

Example of Inspection Institutions
- Nippon Kaiji Kentei Kyokai
  (International Inspectation & Surveying Organization)
- SK(Shin Nihon Kentei Kyokai)
- ANCC (All Nippon Checkers Corporation)

etc.

Reference: JETRO Homepage
http://www.jetro.go.jp/world/shinsai/20110318_11.html

JAMA(Japan Automobile Manufacturers Association)
Comments on Radiation Testing Related to the Fukushima Nuclear Power Plant Situation
(April 18,2011)

<extracts>

The tests implemented by JAMA －which are conducted directly on various designated areas of the surface of vehicles－ are showing results that fall within the range designated by the Nuclear Safety Commission of Japan as being unthreatening to human health, based on the daily readings performed by the Ministry of Education, Culture, Sports, Science and Technology in every prefecture since March25.

Reference：JAMA Homepage: http://www.jama-english.jp/release/comment/2011/110418.html

Safety of Drinking Water

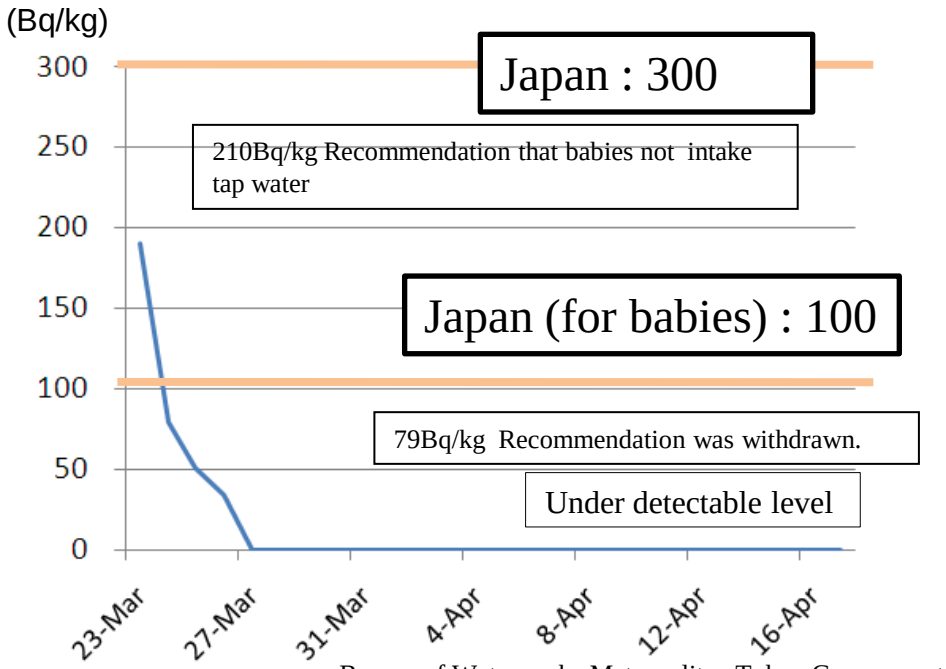
The Japanese Government has been implementing necessary measures based on its stringent criteria for radionuclides in drinking water, and monitoring radionuclide levels every day.

Guidance Levels for Radionuclides in Drinking Water

(Bq/kg)	Japan	EU
radioactive iodine(I131)	300 (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)



Bureau of Waterworks Metropolitan Tokyo Government

*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.

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.

Emergency Dose Limit

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

Ministry of Health, Labour and Welfare, Nuclear and Industrial Safety Agency

ICRP's limit : 500mSv

*ICRP = International Commission on Radiological Protection

Workers Exposed to Radiation in Fukushima Dai-ichi NPS, as of April 24

level of exposure	number of workers
more than 100mSv	30
more than 250mSv	0

Nuclear and Industrial Safety Agency

*On March 24, three workers exposed to more than 100mSv were hospitalized, but were released three days later after no health problems were found.

Measurement of Radiation Dose around the Metropolitan Airports

The current level of radiation dose of airports in the Tokyo Metropolitan area(Narita and Haneda airports) is at very safe level to health.

Measured dose

http://www.mlit.go.jp/koku/koku_tk7_000003.html

	Measurement points		May.9 AM	May.9 PM	May.10 AM		年換算値
Narita Airport	○	Narita Airport	0.108 μ Gy/h 10:00	0.103 μ Gy/h 19:00	0.105 μ Gy/h 10:00	≒0.000105mSv/h	0.92mSv
Haneda Airport	☆	Haneda Airport (Ukishimacho,Kawasaki City.)	0.073 μ Gy/h 10:00	0.074 μ Gy/h 19:00	0.072 μ Gy/h 10:00	≒0.000072mSv/h	0.63mSv

1) According to the website of Tokyo-Electric Power Company, the unit is converted as follows;
1 micro-Gray/hour (μGy/hr) ≒ 1 micro-Sievert /hour (μSv/hr).

2) " Annual exposure calculation" is the estimation under the condition that the hourly radiation dose measurement at the measurement point is accumulated for 24 hours throughout the year.

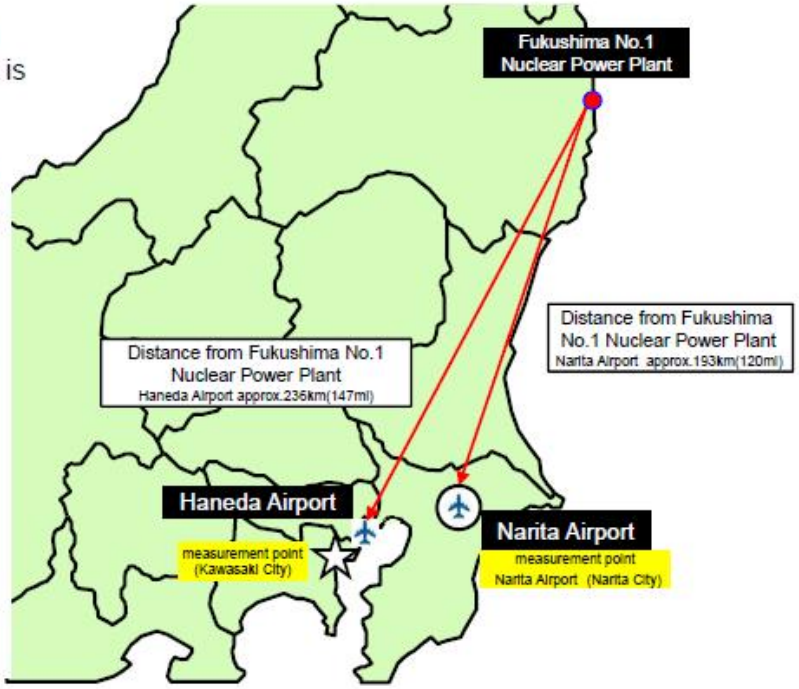
3) 1 mili-Sievert (mSv) = 1000 micro-Sievert (μSv)

According to the Ministry of Education, Culture, Sports, Science and Technology, examples of exposure level of radiation in daily life is as below.
- Chest X-ray (once) 0.05 mSv
- 1 roundtrip between Tokyo and New York by air 0.2 mSv
-Stomach X-ray (once) 0.6 mSv
According to the WHO, a person is exposed to approximately 3.0mSv/year on average.

References;

○	NARITA INTERNATIONAL AIRPORT CORPORATION Website http://www.narita-airport.jp/en/radiation.html
☆	Kanagawa Environmental-radiation Monittoring-system Website(Japanese only) http://www.atom.pref.kanagawa.jp/cgi-bin2/telemeter_dat.cgi?Area=1&Type=W

Radiation Measurement Map



Source: Ministry of Land, Infrastructure, Transport and Tourism

Measurement of Radiation Dose in the Ports around Tokyo Bay

The current level of radiation dose of seaports of Tokyo Bay(Ports of Tokyo, Yokohama, Kawasaki and Chiba) is at very safe level to health.

Measured dose

http://www.mlit.go.jp/kowan/kowan_fr1_000041.html

		Measurement points (Address)	May.8 PM	May.9 AM	May.9 PM		Annual exposure calculation
Port of Tokyo	◎	Tokyo Metropolitan Institute of Public Health (Hyakunin-cho, Shinjuku-ku,Tokyo)	66nGy/h 17:00	66nGy/h 8:00	65nGy/h 17:00	≒0.000065 mSv/h	0.57mSv
Port of Yokohama	☆	Environmental Science Research Institute (Takigashira, Isogo-ku, Yokohama, Kanagawa)	32nGy/h 17:00	33nGy/h 8:00	32nGy/h 17:00	≒0.000032 mSv/h	0.28mSv
Port of Kawasaki	△	Kawasaki Municipal Research Institute for Environmental Protection (Tajima-cho, Kawasaki-ku, Kawasaki, Kanagawa)	47nGy/h 17:00	47nGy/h 8:00	47nGy/h 16:00	≒0.000047 mSv/h	0.41mSv
Port of Chiba	□	Chiba Prefectural Environmental Research Center (Iwasaki-Nishi, Ichihara, Chiba)	48nGy/h 17:00	47nGy/h 8:00	47nGy/h 16:00	≒0.000047 mSv/h	0.41mSv

1) According to the website of Tokyo-Electric Power Company, the unit is converted 1 nano-Gray/hour (nGy/hr) ≒ 1 nano-Sievert /hour (nSv/hr).
2) "Annual exposure calculation" is the estimation under the condition that the hourly radiation dose measurement at the measurement point is accumulated 24 hours throughout the year.
3) 1 mili-Sievert (mSv) = 1000 micro-Sievert (μSv)
1 micro-Sievert (μSv) =1000 nano-Sievert (nSv)

According to the Ministry of Education, Culture, Sports, Science and Technology, examples of exposure level of radiation in daily life is as below.

- **Chest X-ray (once)** **0.05 mSv**
- **1 roundtrip between Tokyo and New York by air** **0.2 mSv**
- **Stomach X-ray (once)** **0.6 mSv**

According to the WHO, a person is exposed to approximately 3.0mSv/year on average.

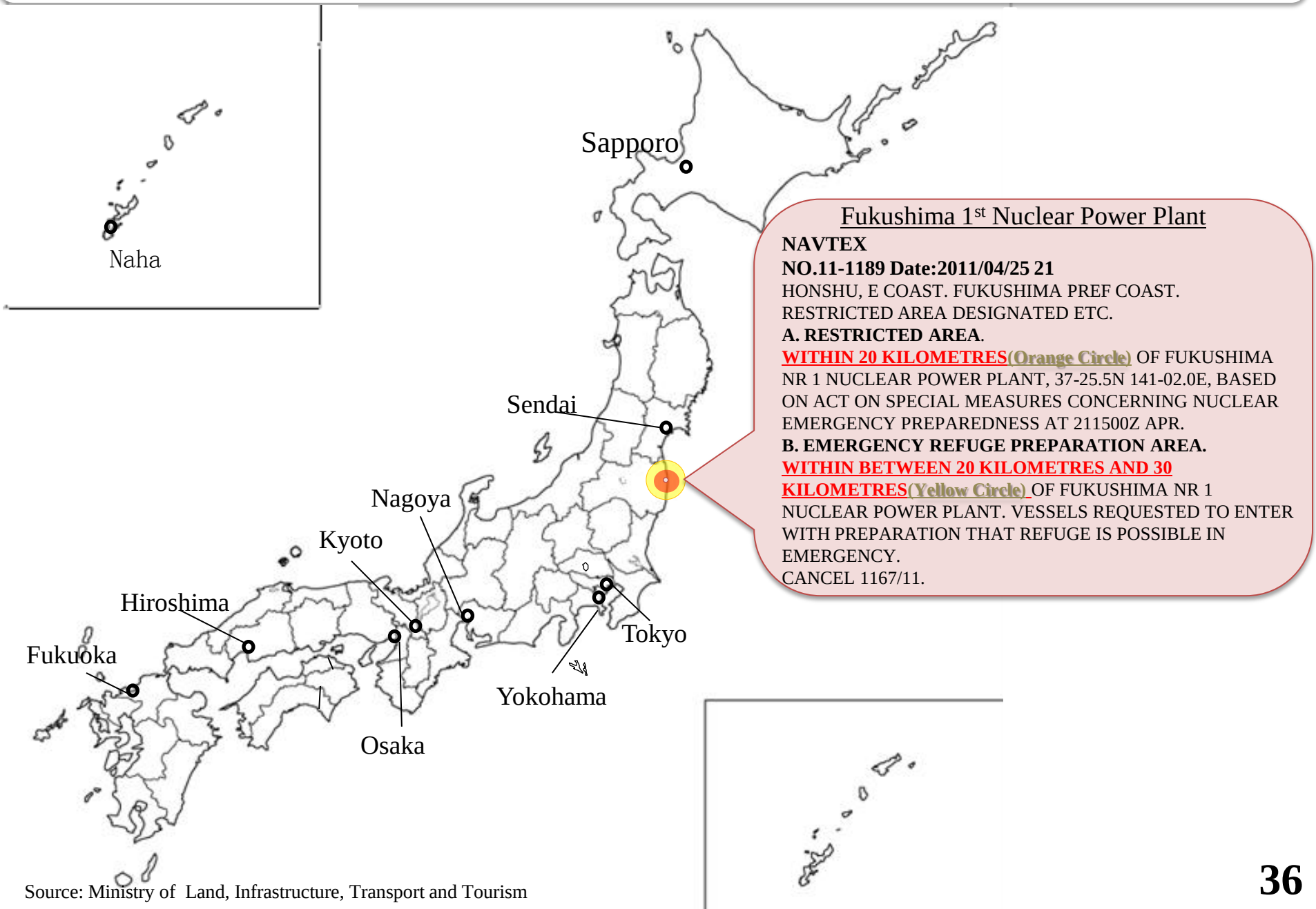
References;

◎	Tokyo Metropolitan Institute of Public Health Website (Japanese only) http://www.tokyo-eiken.go.jp/monitoring/index.html
☆	City of Yokohama, Environmental Planning Bureau Website(Japanese only) http://www.city.yokohama.lg.jp/kankyo/saigai/
△	City of Kawasaki Website(Japanese only) http://www.city.kawasaki.jp/e-news/info3715/index.html
□	Chiba Prefecture Government Website(Japanese only) http://www.pref.chiba.lg.jp/index.html

Distance from Fukushima No1 Nuclear Plant

Source: Ministry of Land, Infrastructure, Transport and Tourism

Navigational Warnings (Vessels)

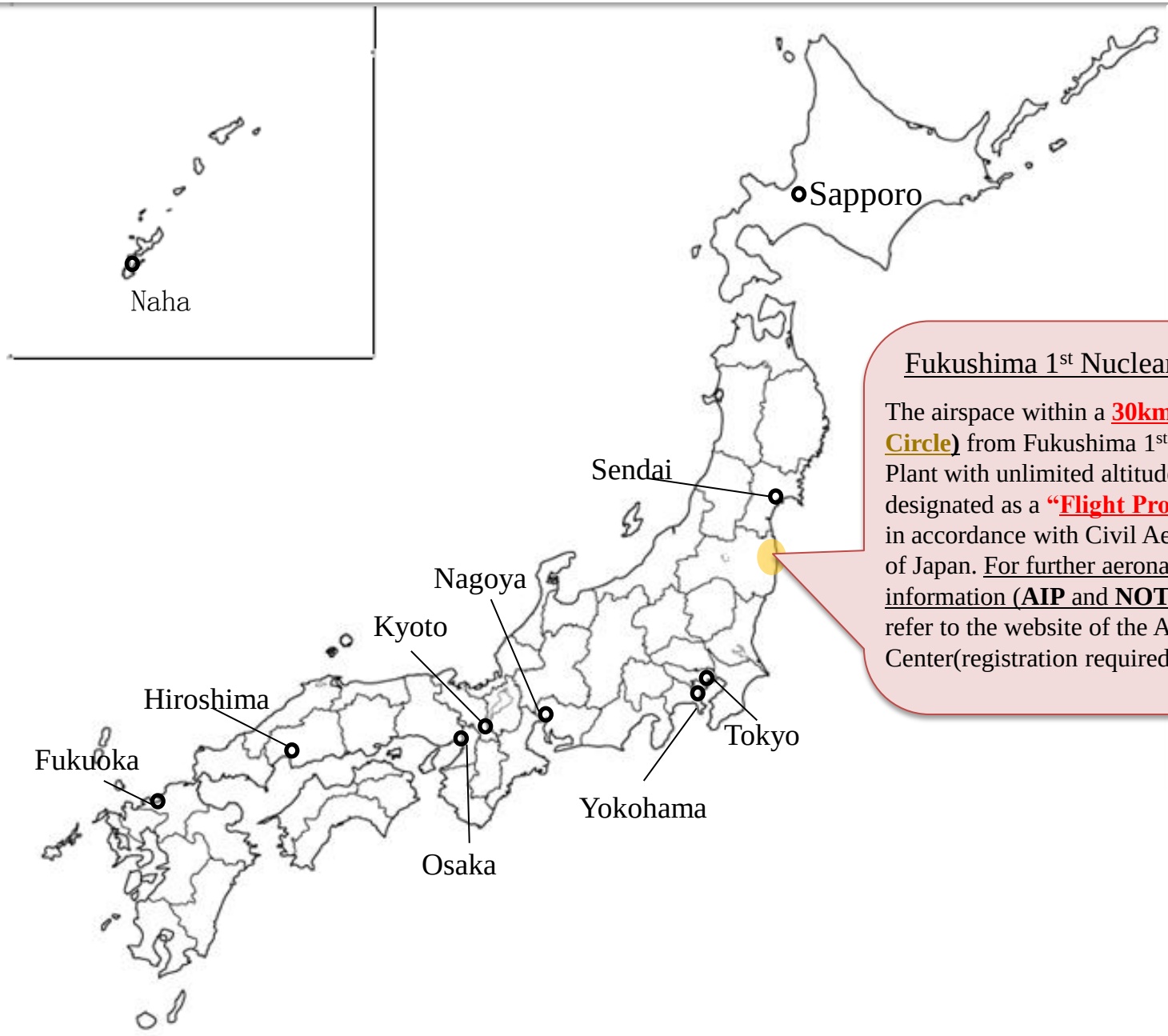


Fukushima 1st Nuclear Power Plant

NAVTEX
NO.11-1189 Date:2011/04/25 21
HONSHU, E COAST. FUKUSHIMA PREF COAST.
RESTRICTED AREA DESIGNATED ETC.
A. RESTRICTED AREA.
WITHIN 20 KILOMETRES(Orange Circle) OF FUKUSHIMA NR 1 NUCLEAR POWER PLANT, 37-25.5N 141-02.0E, BASED ON ACT ON SPECIAL MEASURES CONCERNING NUCLEAR EMERGENCY PREPAREDNESS AT 211500Z APR.
B. EMERGENCY REFUGE PREPARATION AREA.
WITHIN BETWEEN 20 KILOMETRES AND 30 KILOMETRES(Yellow Circle) OF FUKUSHIMA NR 1 NUCLEAR POWER PLANT. VESSELS REQUESTED TO ENTER WITH PREPARATION THAT REFUGE IS POSSIBLE IN EMERGENCY.
CANCEL 1167/11.

Source: Ministry of Land, Infrastructure, Transport and Tourism

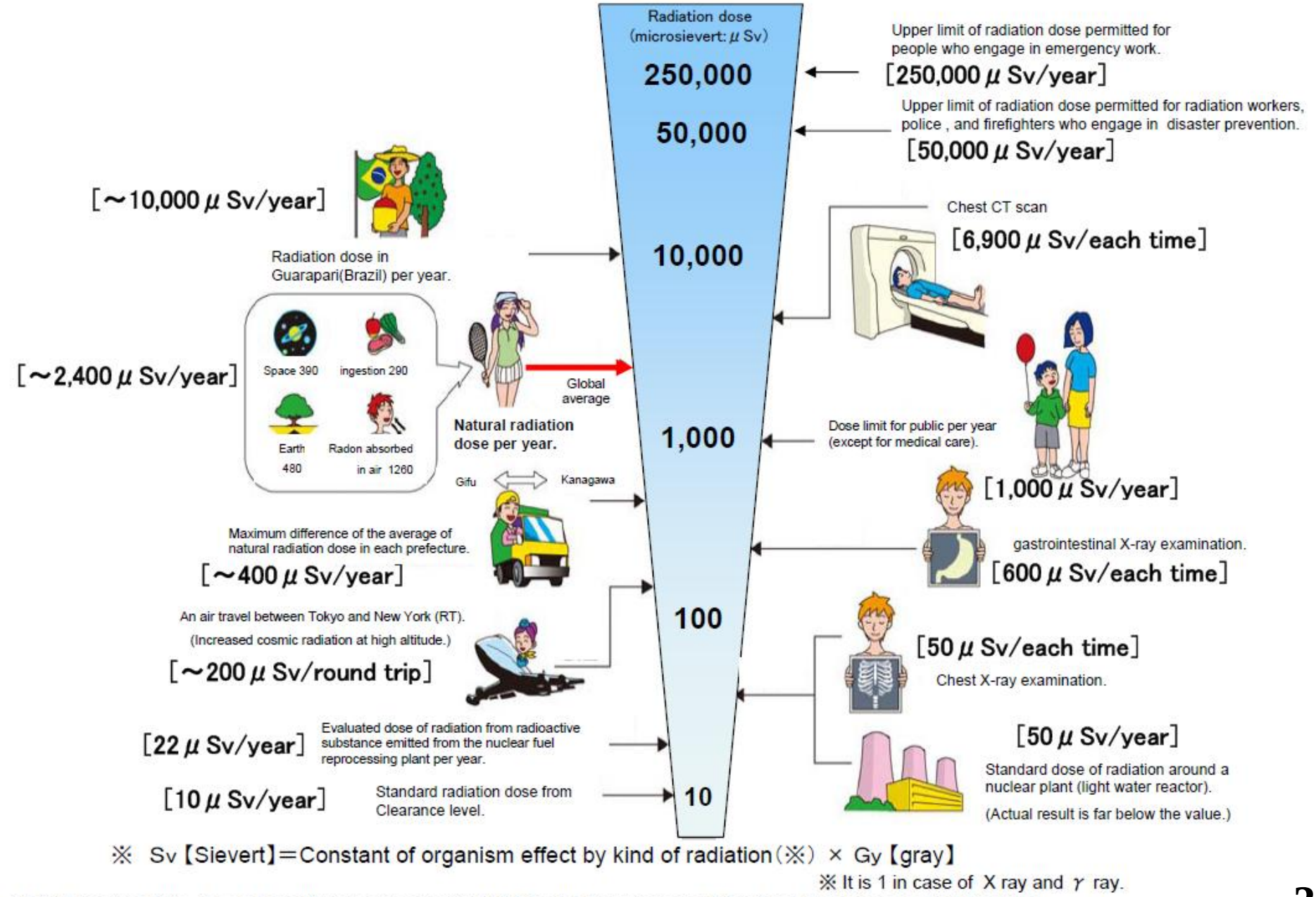
Flight Routes and Airspace



Fukushima 1st Nuclear Power Plant

The airspace within a **30km-radius** (**Yellow Circle**) from Fukushima 1st Nuclear Power Plant with unlimited altitude has been designated as a **"Flight Prohibited Area"** in accordance with Civil Aeronautics Law of Japan. For further aeronautical information (**AIP** and **NOTAM**), please refer to the website of the AIS Center(registration required).

Radiation in Daily-life



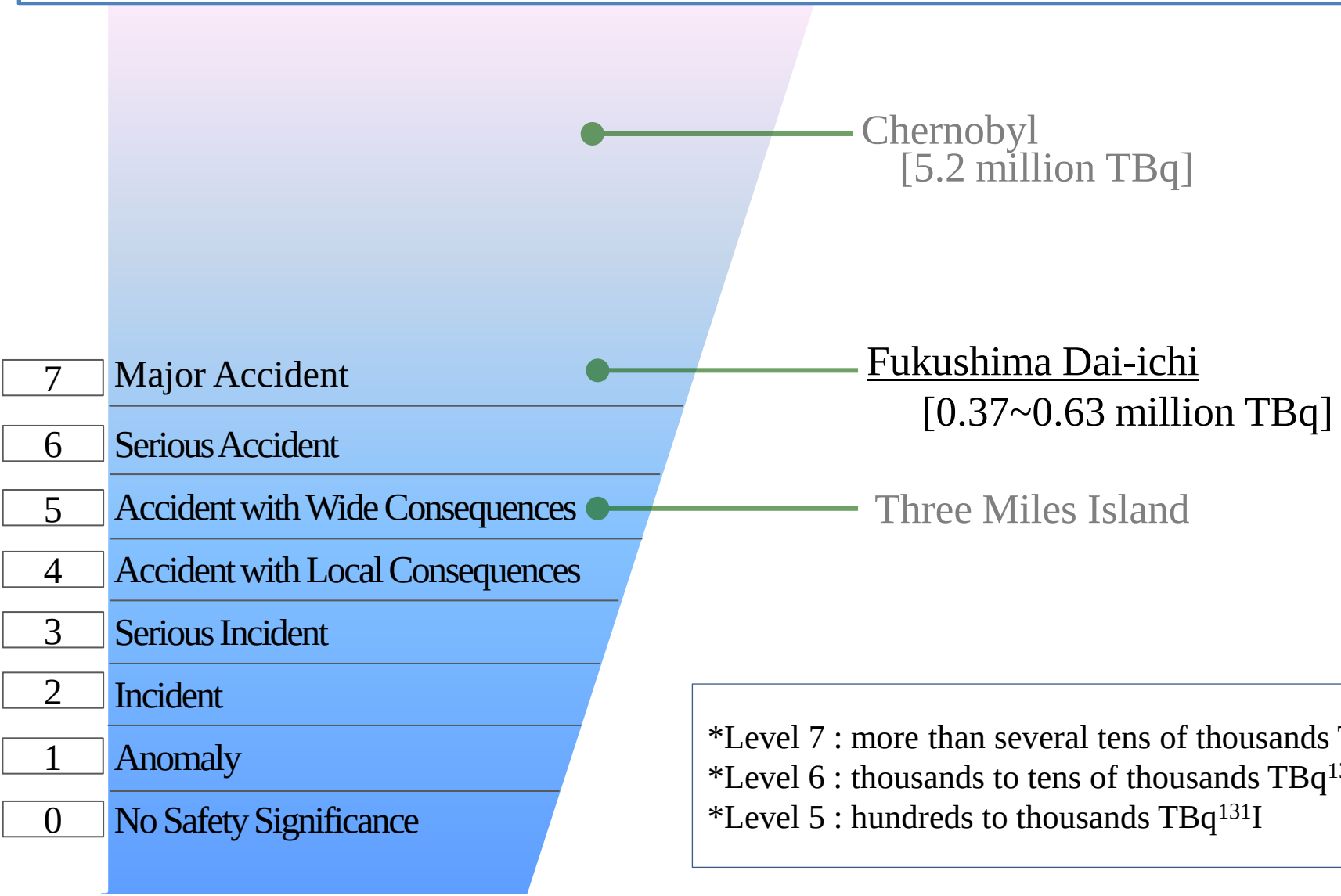
※ Sv【Sievert】=Constant of organism effect by kind of radiation(※) × Gy【gray】

※ It is 1 in case of X ray and γ ray.

MEXT makes this, based on "Nuclear power 2002" made by Agency of Natural Resources and Energy.

INES Rating on the Events in Fukushima Dai-ichi NPS

The Rating of the International Nuclear and Radiological Event Scale (INES) on Fukushima Dai-ichi Nuclear Power Station (NPS), in temporary assessed as Level 7.



*Level 7 : more than several tens of thousands TBq ^{131}I
*Level 6 : thousands to tens of thousands TBq ^{131}I
*Level 5 : hundreds to thousands TBq ^{131}I

C. Impact on Japanese Economy

1. Estimated Economic Damage of the Tohoku-Pacific Ocean Earthquake and Plan for Reconstruction

2. Impact on Energy Supply/Demand in Japan

1. Estimated Economic Damage of the Tohoku-Pacific Ocean Earthquake and Plan for Reconstruction

Damaged Stocks in Disaster Areas

*estimated by the Cabinet Office of Japan

16～25 trillion Yen
(US$195～305 billion)

(Reference) Japan's GDP : 500 trillion Yen (US$5.9 trillion)

Plan for Recovery and Reconstruction

*from the speech of Prime Minister Kan on Apr. 1 and Apr. 12

Short-term: clearing debris, erecting temporary housing, rehabilitating industrial facilities

Mid and long-term: creating disaster-resilient local community, eco-friendly social system, and welfare-oriented society

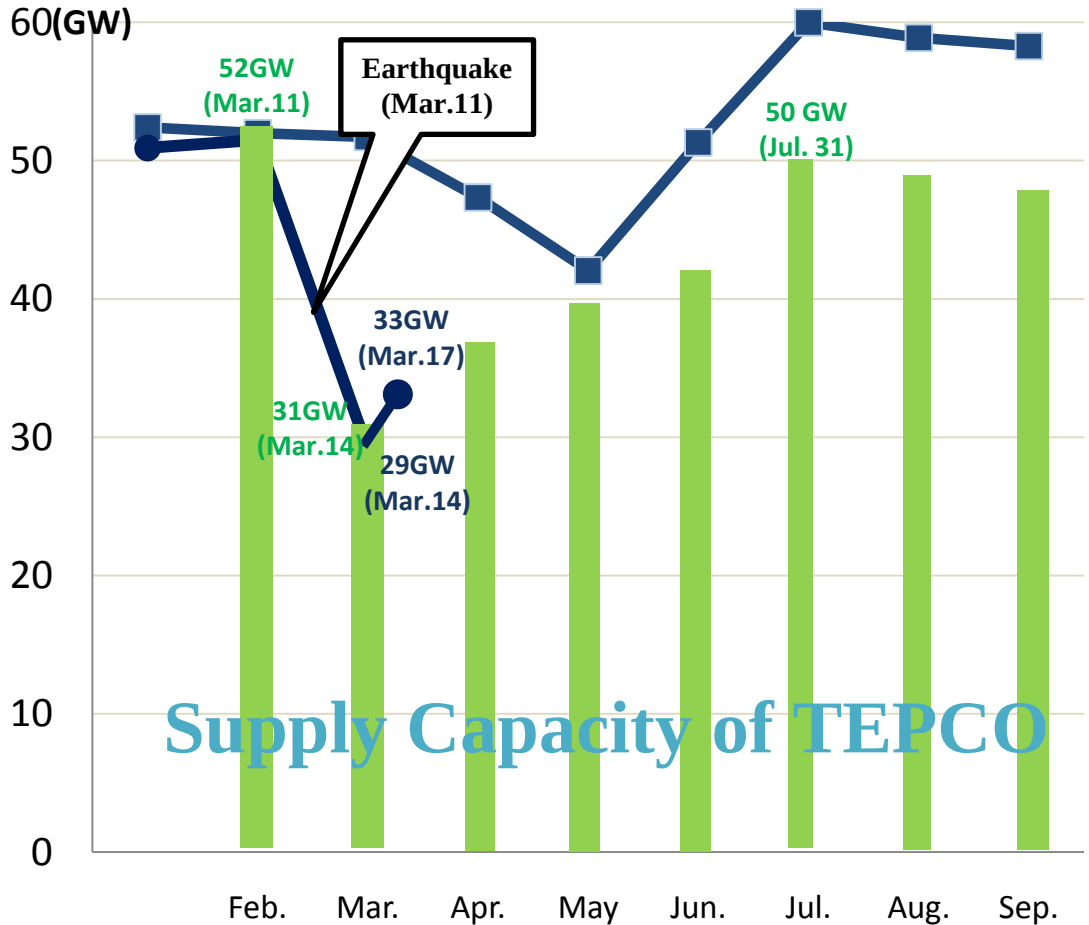
"Reconstruction Planning Council" established

Compiling supplementary budgets and enacting/amending relevant laws

2. Impact on Energy Supply/Demand in Japan

Tokyo Electric Power Company supplies electricity to an area with 42 million people and 40% of Japan's GDP, but lost 40% of its generation capacity after the earthquake and tsunami.

We are making the utmost efforts to match supply and demand during the peak-load summer on both the demand and supply side.



Peak Demand of the Month in 2010

Peak Demand of the Month in 2011

Supply Capacity of TEPCO in 2011
- before March :actual value
- after April : estimated value
(by METI on April 18th)

D. Cooperation and Information sharing with the International Community

1. Cooperation with International Organizations
2. Speedy Dissemination of Accurate Information
3. Press Release by International Organizations

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

(1) In connection with the incidents involving the nuclear power plants in Japan, the IAEA has, upon the request of the Government of Japan, extended assistance by dispatching a series of the IAEA experts mainly in the field of radiation monitoring. Such dispatch of experts includes :

(a) Radiation Monitoring Teams, totaling up to 16 members who took measurements mainly in Fukushima from 19 March to 18th April;

(b) One marine expert from the IAEA's laboratory in Monaco, who boarded Research Vessel "MIRAI" during 2 -4 April to observe and provide advice for Japanese experts on their method of collection and analysis of seawater samples; and

(c) A Joint FAO/IAEA Food Safety Assessment Team, who met with local government officials, farmers etc. in Fukushima, Ibaraki, Tochigi and Gunma prefecture.

(2) In addition, IAEA experts in BWR technology met with Japanese officials and operators including NISA and the Tokyo Electric Power Company (TEPCO) and visited the Fukushima Dai-ichi and Dai-ni Nuclear Power Plant on 6 April.

2. 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.http://www.nisa.meti.go.jp/english/

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.http://www.worldvillage.org/fia/kinkyu_english.php
- 4. http://www.tepco.co.jp/en/press/corp-com/release/index-e.html
- 5. http://www.nsc.go.jp/NSCenglish/geje/index.htm

Drinking Water Safety

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

Food Safety

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

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

Tourism

- 1. http://www.mlit.go.jp/kankocho/en/index.html

3. Press Release by International Organizations

Airports

ICAO (International Civil Aviation Organization):

"No Restrictions on Travel to Japan" **(News release: March 18)**
http://www2.icao.int/en/NewsRoom/Lists/News/DispForm.aspx?ID=37

"Current Radiation Levels in Japan and Travel Advice" **(News release: April 1)**
http://www2.icao.int/en/NewsRoom/Lists/News/DispForm.aspx?ID=39

"Current Situation for Travel and Transport to and from Japan" **(News release: April 14)**
http://www2.icao.int/en/NewsRoom/Lists/News/DispForm.aspx?ID=40

IATA (International Air Transport Association):

"No Restrictions on Air Travel to Japan" **(News release: March 19)**
http://www.iata.org/pressroom/pr/Pages/2011-03-18-02.aspx

"UN Confirms Safety of Japan Operations - No Recommendation for Passenger Screening **(News release: April 1)**
http://www.iata.org/pressroom/pr/Pages/2011-04-01-01.aspx

Ports

IMO (International Maritime Organization):

"No Restrictions on Travel to Japan" **(News release: March 20)**
http://www.imo.org/MediaCentre/PressBriefings/Pages/No-restrictions-on-travel-to-Japan.aspx

"Shipping advised to comply with relevant NAVAREA warnings off Japan" **(News release: March 24)**
http://www.imo.org/MediaCentre/PressBriefings/Pages/13-navigation-off-japan.aspx

"Current radiation levels in Japan and travel advice" **(News release: April 1)**
http://www.imo.org/MediaCentre/PressBriefings/Pages/17-radiation-.aspx

"Current situation for travel and transport to and from Japan" **(News release: April 15)**
http://www.imo.org/MediaCentre/PressBriefings/Pages/22-japan-update.aspx

IAPH (The International Association of Ports and Harbours) :

"Japanese ports are safe" **(News release: March 25)** http://www.iaphworldports.org/#

PIANC (The World Association for Waterborne Transport Infrastructure) :

"No fear on port function and people's health" **(News release: April 4)**
http://www.pianc.org/downloads/events/Message%20from%20PIANC%20Japan.pdf

3. Press Release by International Organizations

Others

WHO(World Health Organization)

- ***"WHO is not advising general restrictions on travel to Japan" (FAQ March 20)***
  http://www.who.int/hac/crises/jpn/faqs/en/index3.html
- ***"Drinking tap water in Japan poses no immediate health risk," (FAQ March 25)***
  http://www.who.int/hac/crises/jpn/faqs/en/index8.html
- ***"There are no health risks to people living in other countries from radioactive material" (FAQ April4)***
  http://www.who.int/hac/crises/jpn/faqs/en/index.html
- ***"Public health risks beyond the 30km evacuation zone currently still low" (FAQ April 13)***
  http://www.who.int/hac/crises/jpn/en/index.html