

## B. Key Challenges

1. Cool Down of the Reactors
2. Contain the Spread of Radioactive Substances
3. Rigorous and Intensive Monitoring
4. Ensure the Safety of Food, Products, and  
Decontamination

# 1. Cool Down the Reactors

## Cold Shutdown Condition Achieved.(Completion of Step2)

**Cold shutdown condition** has been achieved (declared on December 16<sup>th</sup>) through the installation of circulating cooling systems for the reactors.

Revision of the evacuation zones is to be carried out on the completion of Step 2.

### Steady and Sustainable Circulating Cooling System

- Leak of highly radioactive water is prevented.
- Multiple safety measures have been introduced against troubles or accidents.

RPV Bottom Temperature :  
**less than 100 degrees.**

No.1 : 24.1 °C

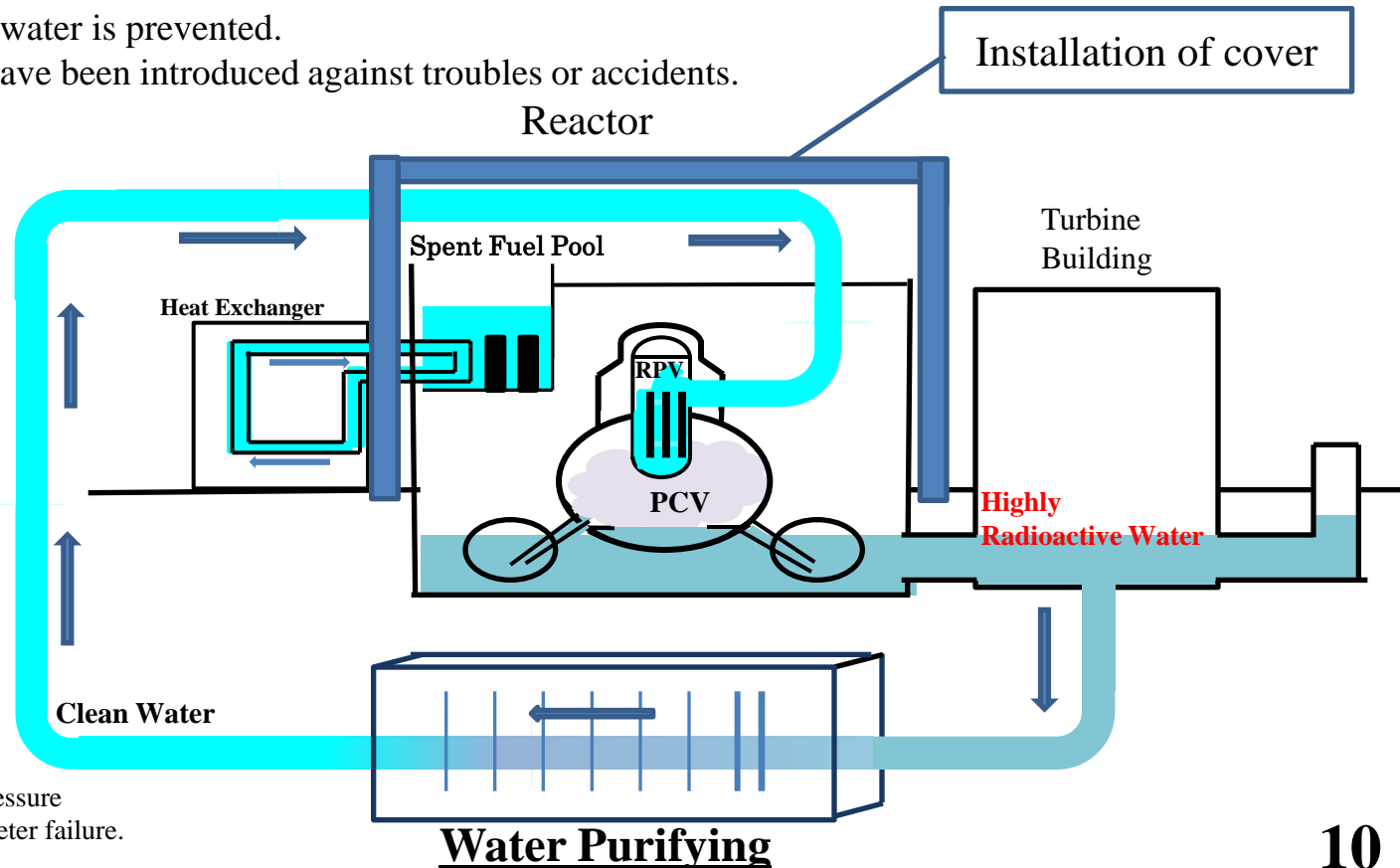
No.2 : 44.4°C\*

No.3 : 52.7 °C

As of February 27th

The radiation exposure at the site:  
**0.1mSv / year**  
(Below the target of 1 mSv / year.)

As of December 16th



\*The trend of the temperature rise in the pressure container vessel of Unit 2 was caused by meter failure.

# 1. Cool Down the Reactors

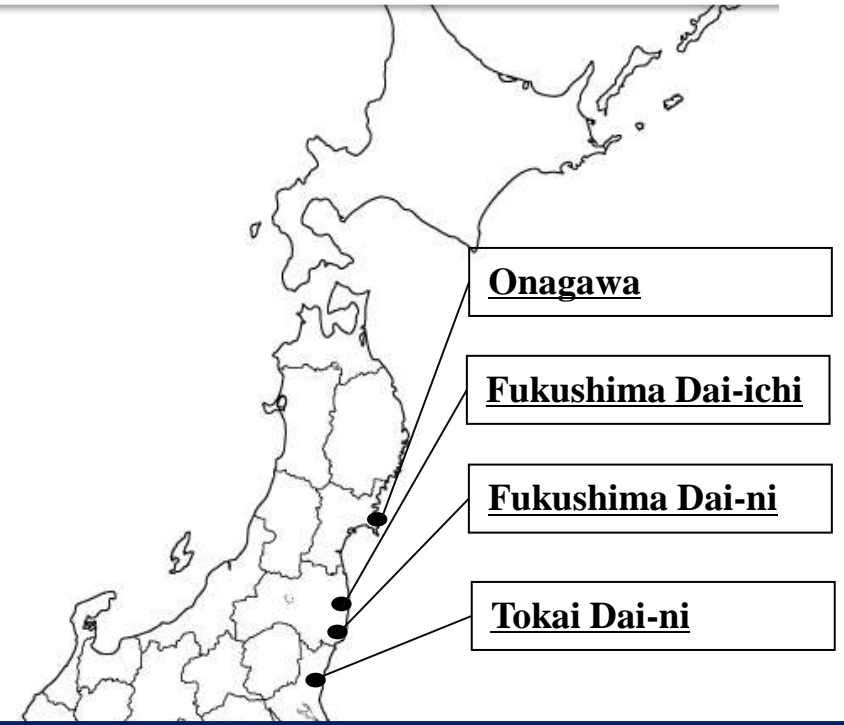
## Other Nuclear Power Stations in the Tohoku Area

### Onagawa (3 Units)



Tohoku Electric Power Co., Inc

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



**Onagawa**

**Fukushima Dai-ichi**

**Fukushima Dai-ni**

**Tokai Dai-ni**

### Fukushima Dai-ni (4 Units)



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

TEPCO

### Tokai Dai-ni (1 Unit)

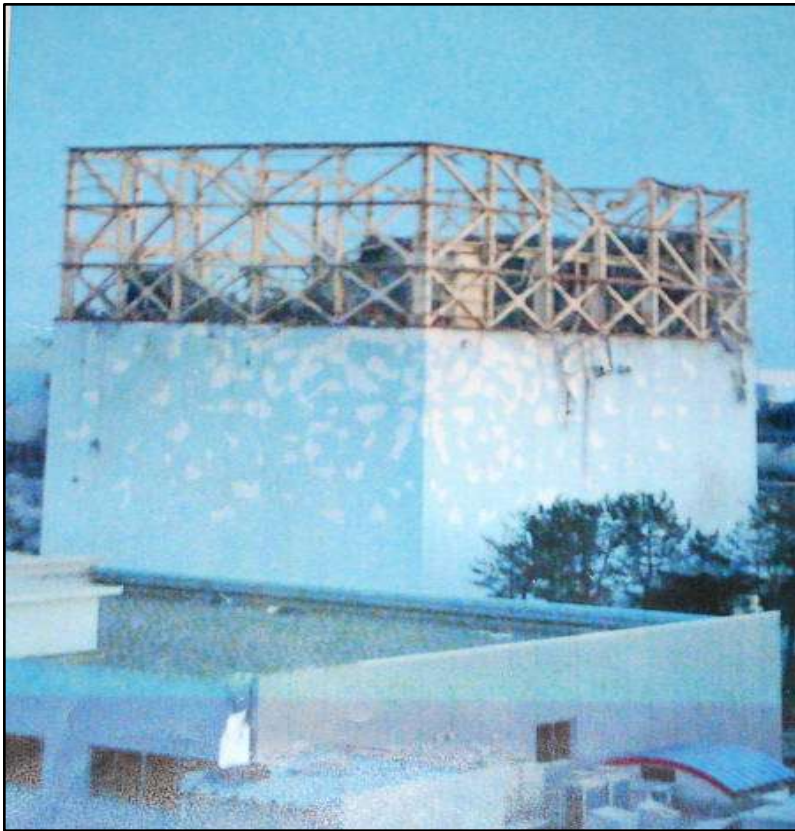
The unit was immediately shut down automatically, then safely went to cold shutdown.



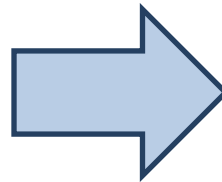
The Japan Atomic Power Company

## 2. Contain the Spread of Radioactive Substances

### Installing reactor cover



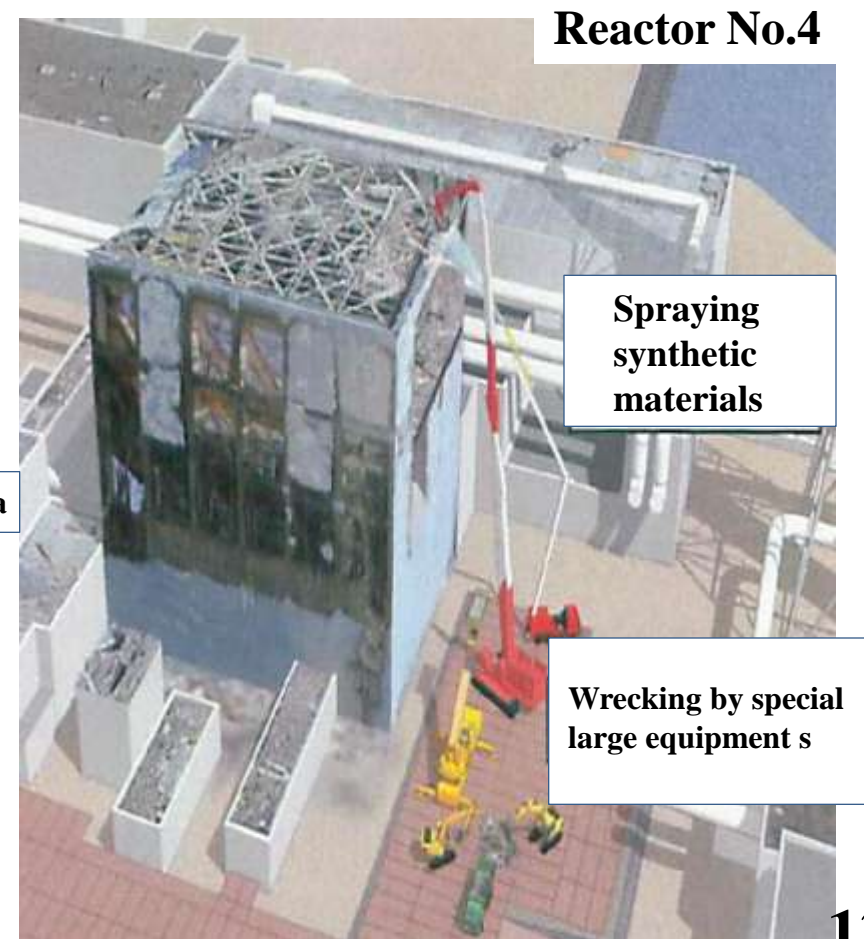
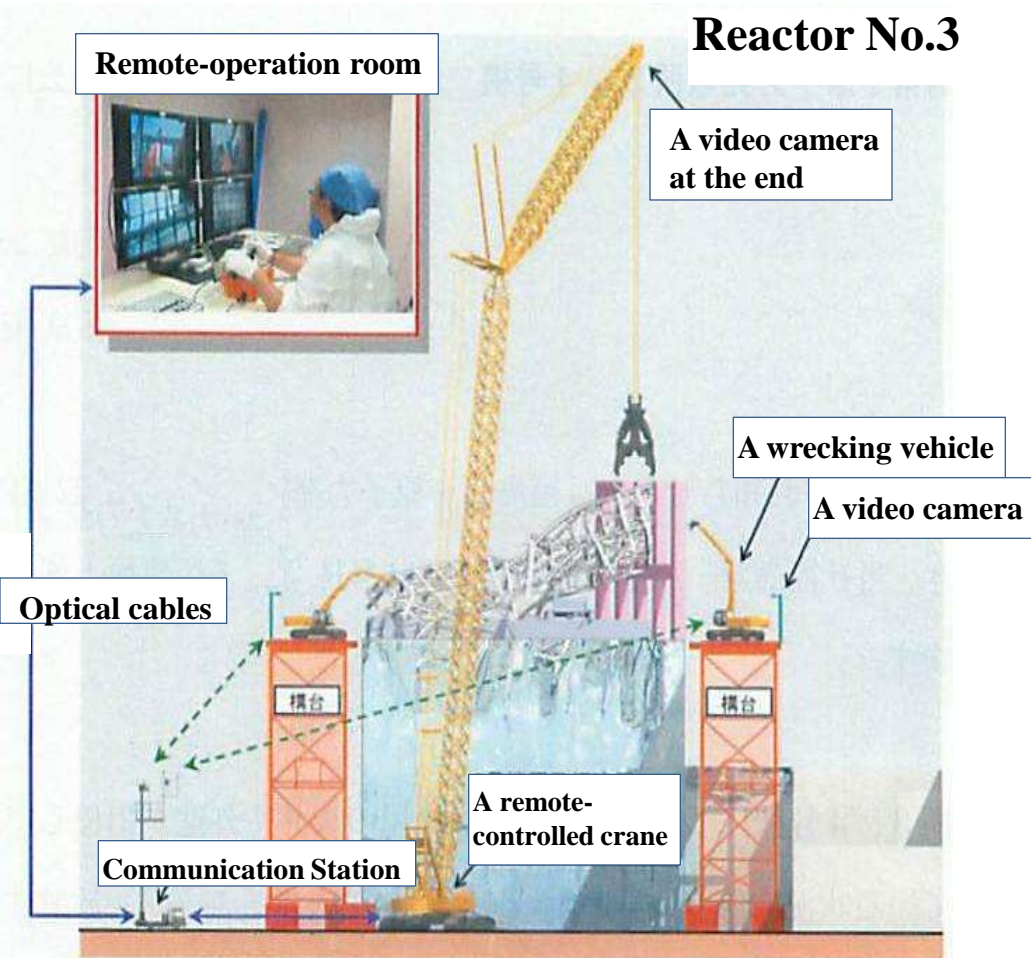
TEPCO



TEPCO

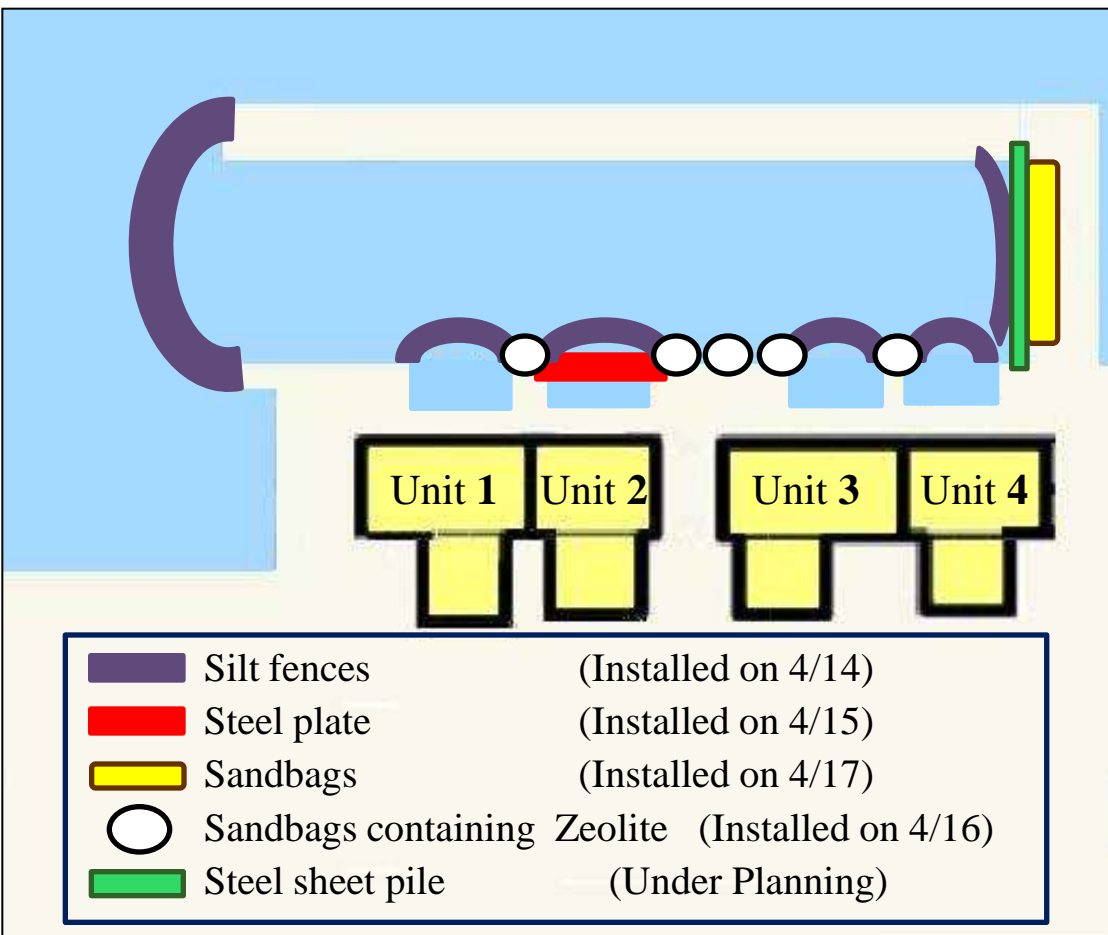
## 2. Contain the Spread of Radioactive Substances (Removal of rubbles from reactors)



TEPCO began working on the rubbles removal at top of the buildings of reactor No.3, and No.4. Most of rubbles around 4 reactors have been removed by now and stored in the special containers. Removal will be completed by late summer 2012 allowing TEPCO to begin removal of spent fuel rods from the pools around 2014 .

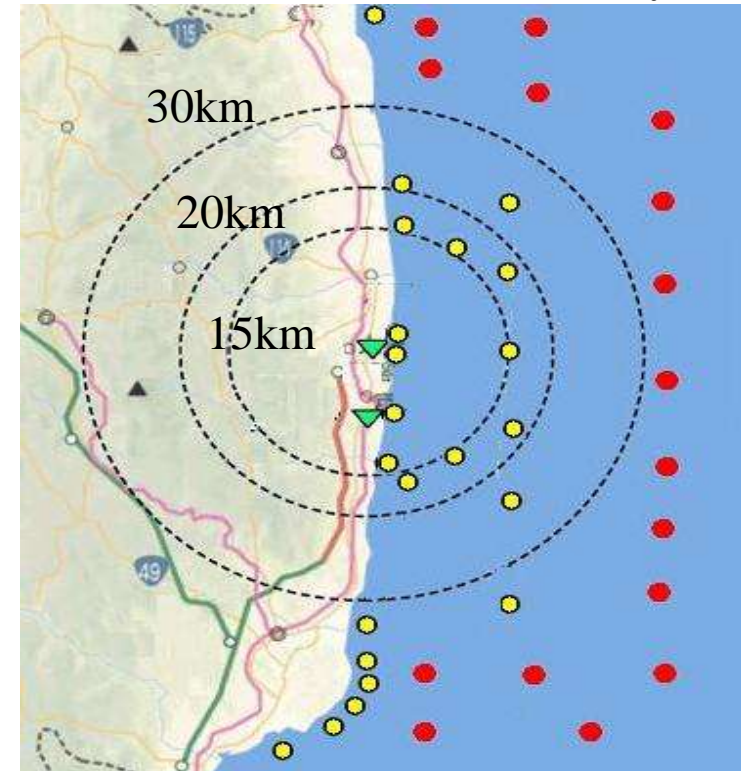


## 2. Contain the Spread of Radioactive Substances

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

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

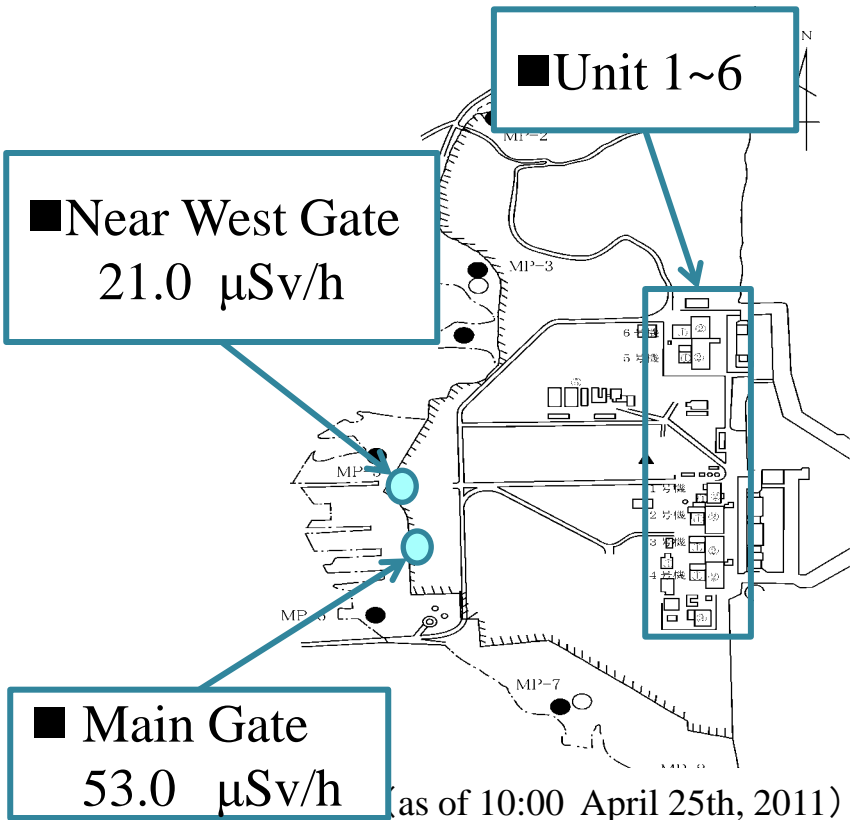
**Spraying synthetic materials on the surface of the ground and debris to prevent radioactive substances dispersion**



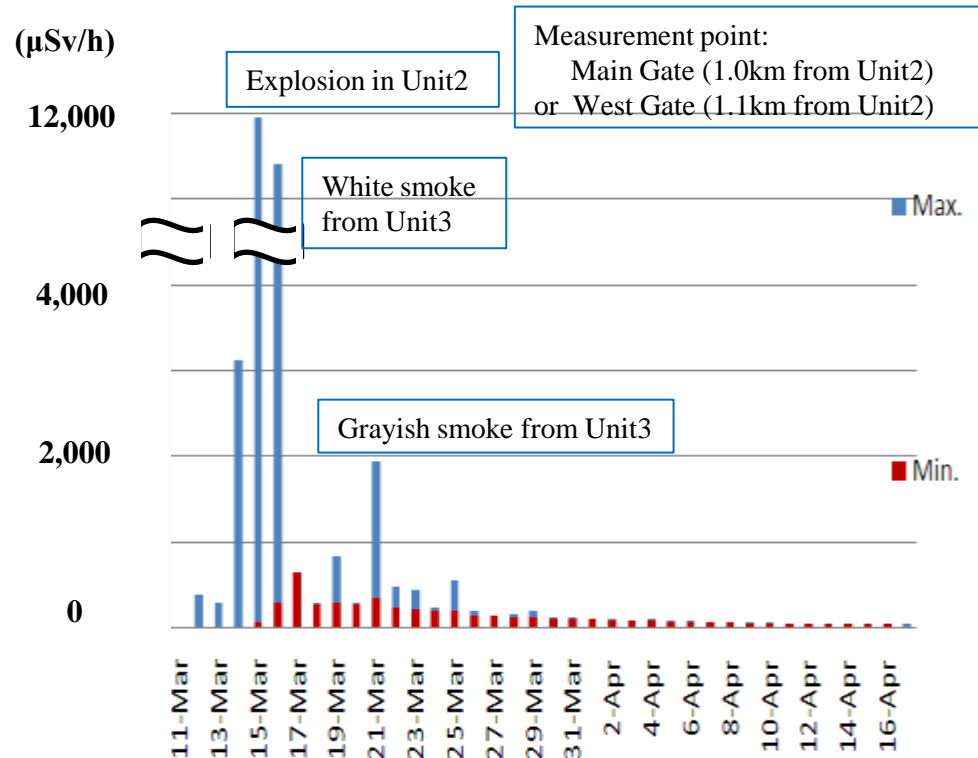
# 3. Rigorous and Intensive Monitoring

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



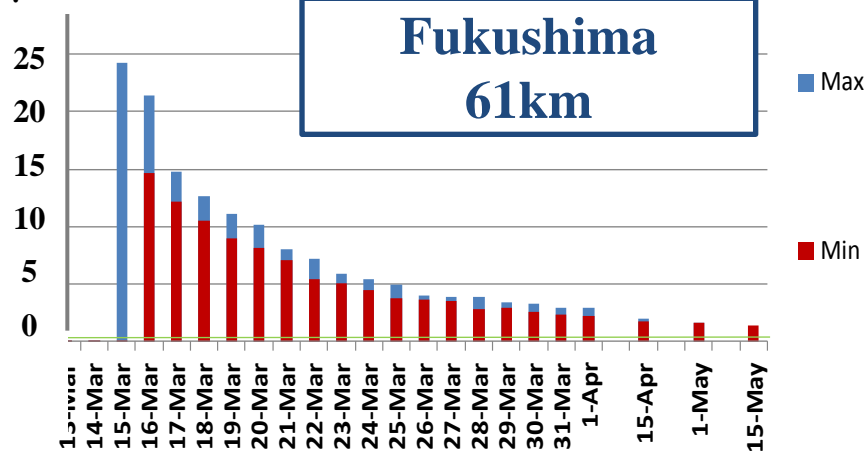
Environmental Radioactivity Level at the Fukushima Dai-ichi NPS



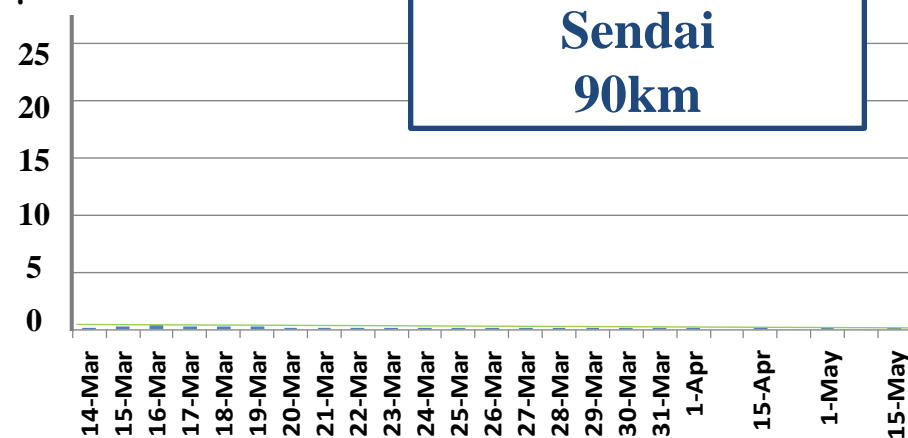
# 3. Rigorous and Intensive Monitoring

## Atmospheric Readings within 100km

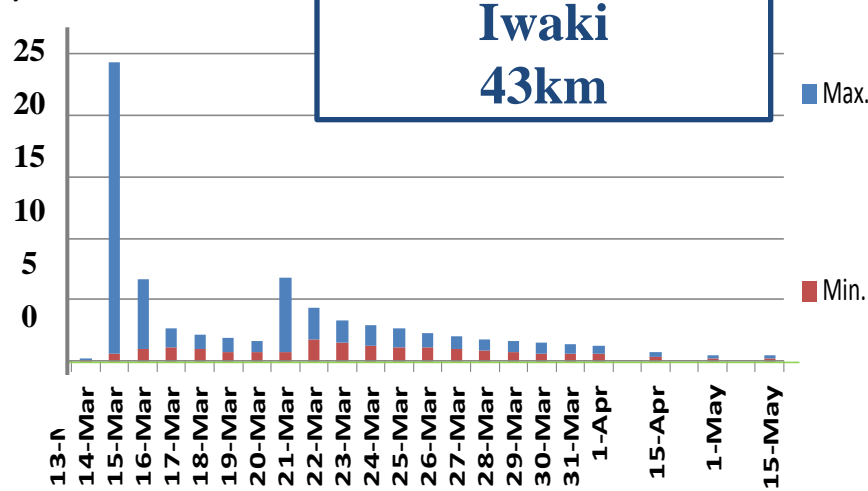
μSv/hour



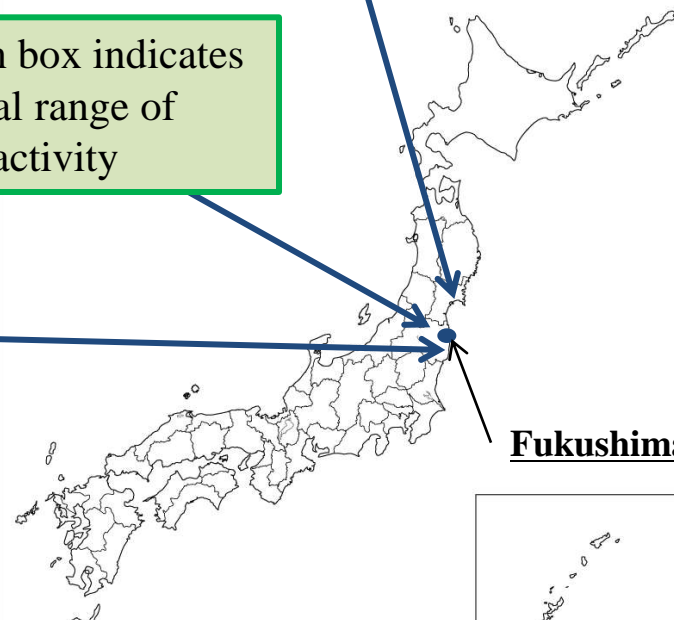
μSv/hour



μSv/hour

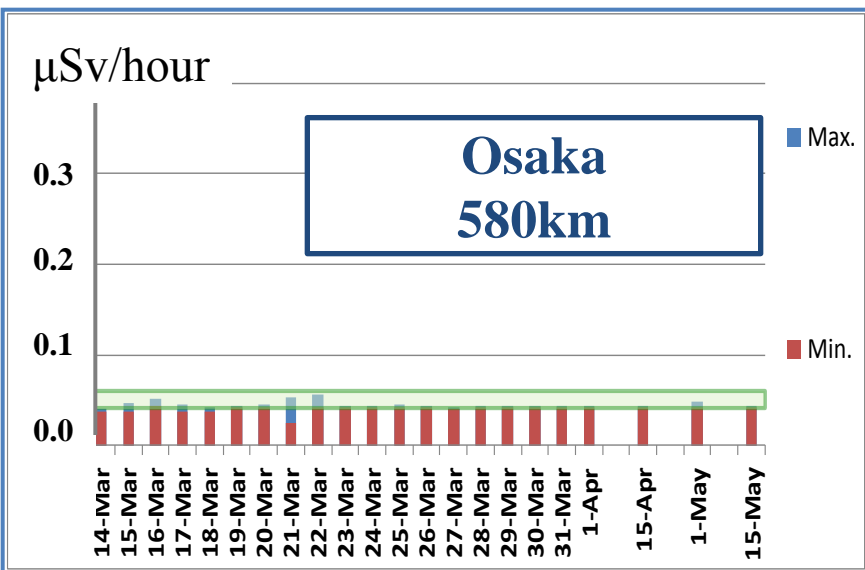
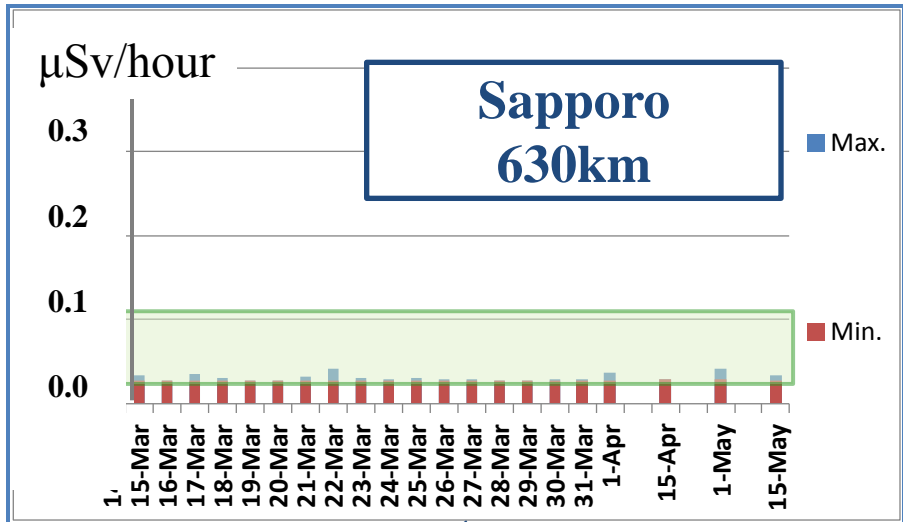
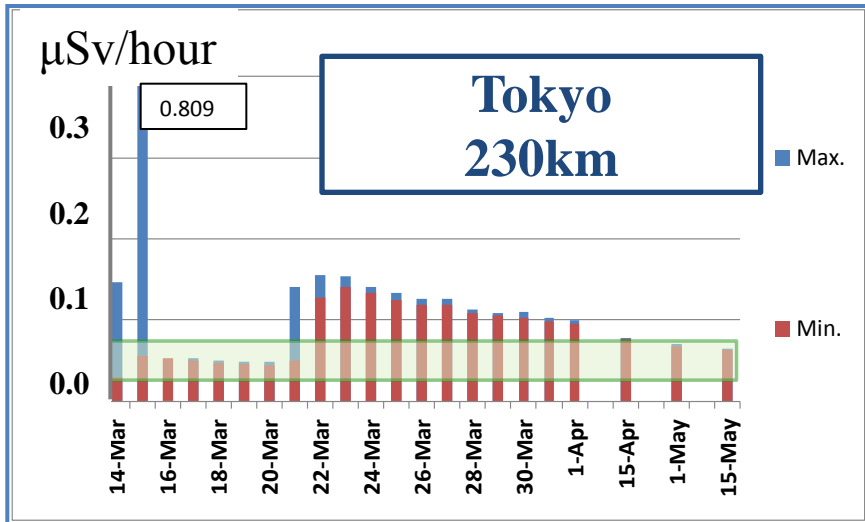


Green box indicates normal range of radioactivity

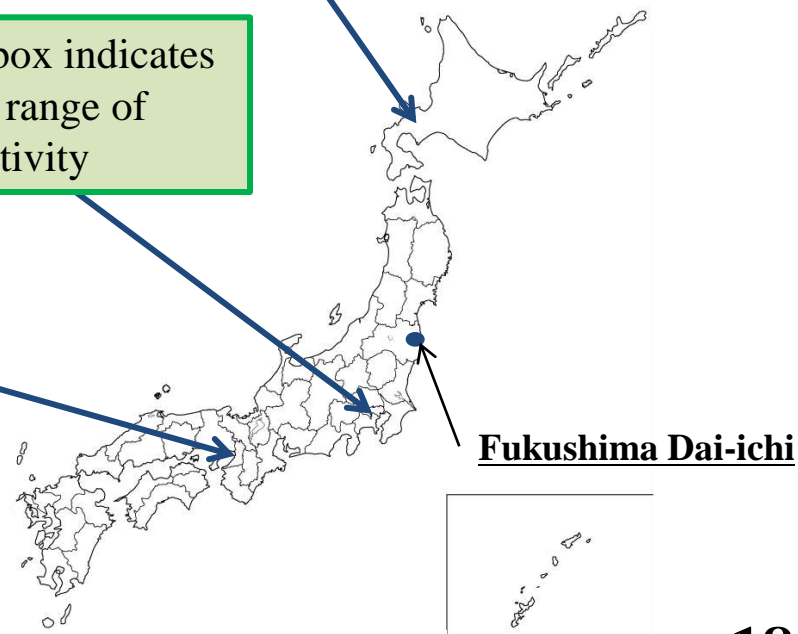


**Fukushima Dai-ichi**

# 3. Rigorous and Intensive Monitoring Atmospheric Readings in Tokyo, Osaka and Sapporo



Green box indicates normal range of radioactivity



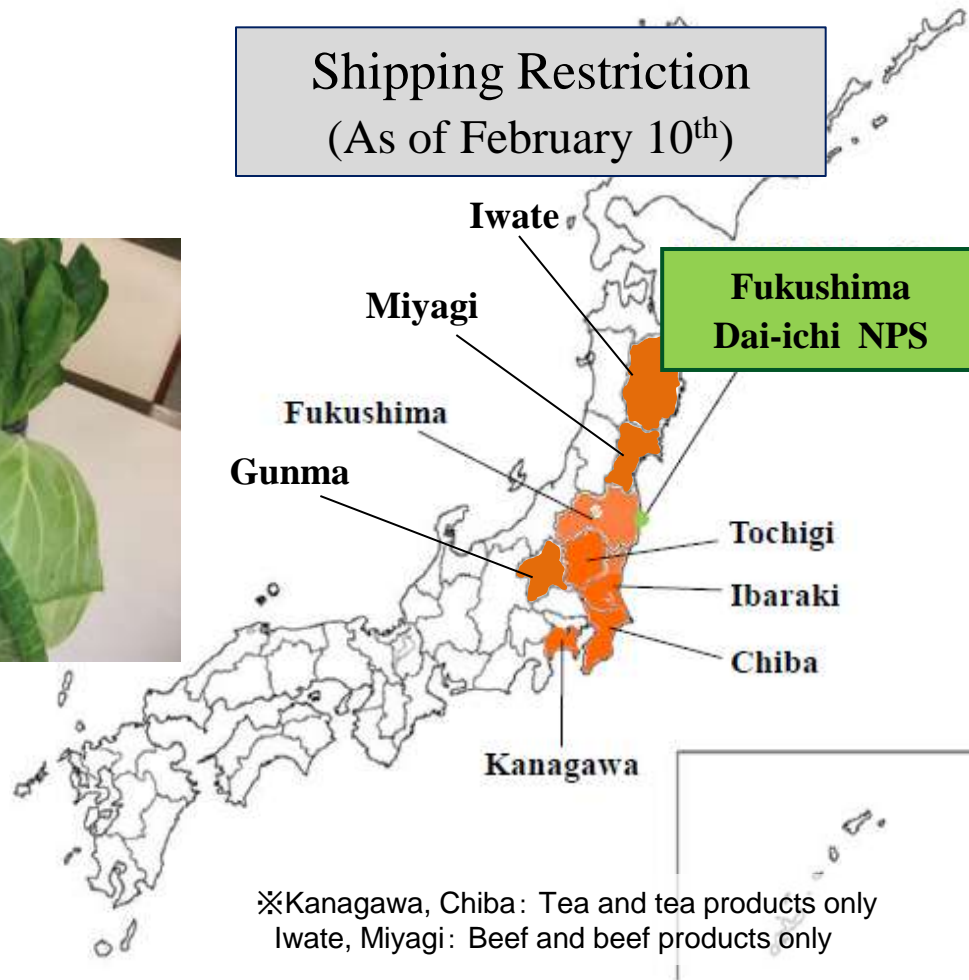
## 4. Ensure the Safety ~Farm Produce ①~

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.

Germanium semiconductor detector



Shipping Restriction  
(As of February 10<sup>th</sup>)



For the latest information, please refer the website below:  
<http://www.mhlw.go.jp/english/topics/2011eq/index.html>

## 4. Ensure the Safety ~Farm Produce ②~

Radioactive cesium which exceeded provisional regulation values (500Bq/kg) was detected in Beef. Using the traceability system established in Japan, Japanese Government determined location and status of all the meat concerned. Testing systems for food safety have been introduced and shipment restriction was lifted by August 25.



Blanket testing has been introduced by Prefectures and prefectural JAs (Japan Agricultural Cooperatives).



Matsuzaka Shokuniku Public Corporation



Tokyo University

**Contamination was caused by eating radioactive rice straw.**



The individual history of all beef can be traced by identification numbers given to each cattle for meat in entire Japan.



Individual Identification Numbers

## 4. Ensure the Safety ~Drinking Water~

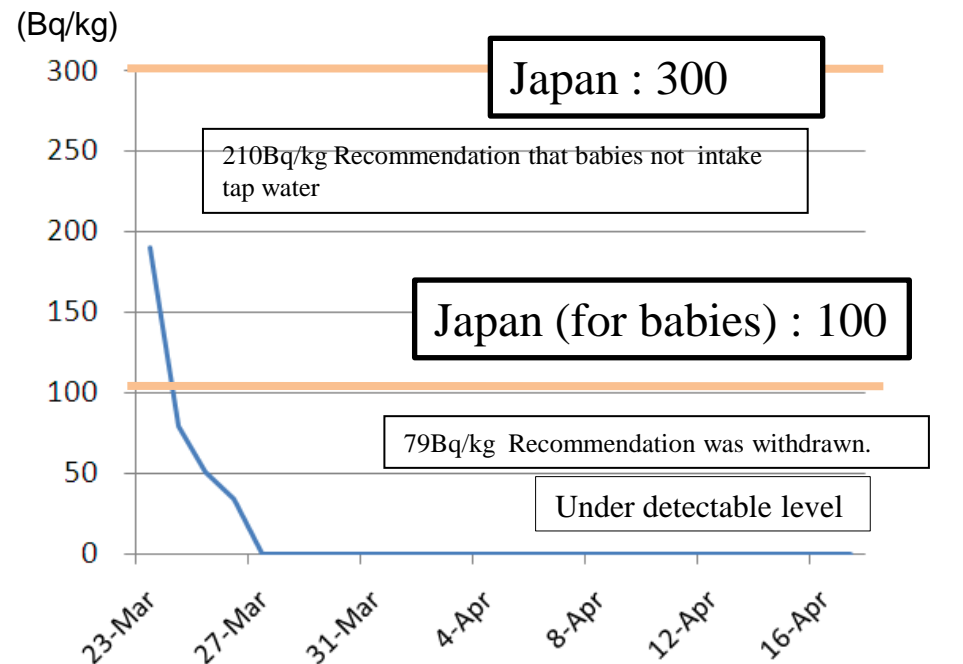
The Japanese Government has been implementing necessary measures based on its stringent criteria for radionuclides in drinking water, and monitoring radionuclide levels every day.

### Guidance Levels for Radionuclides in Drinking Water

(Bq/kg)	Japan	EU
radioactive iodine(I131)	300	500
radioactive iodine(I131) (for babies)	100	
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.

## 4. Ensure the Safety ~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 Inspection & 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](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)

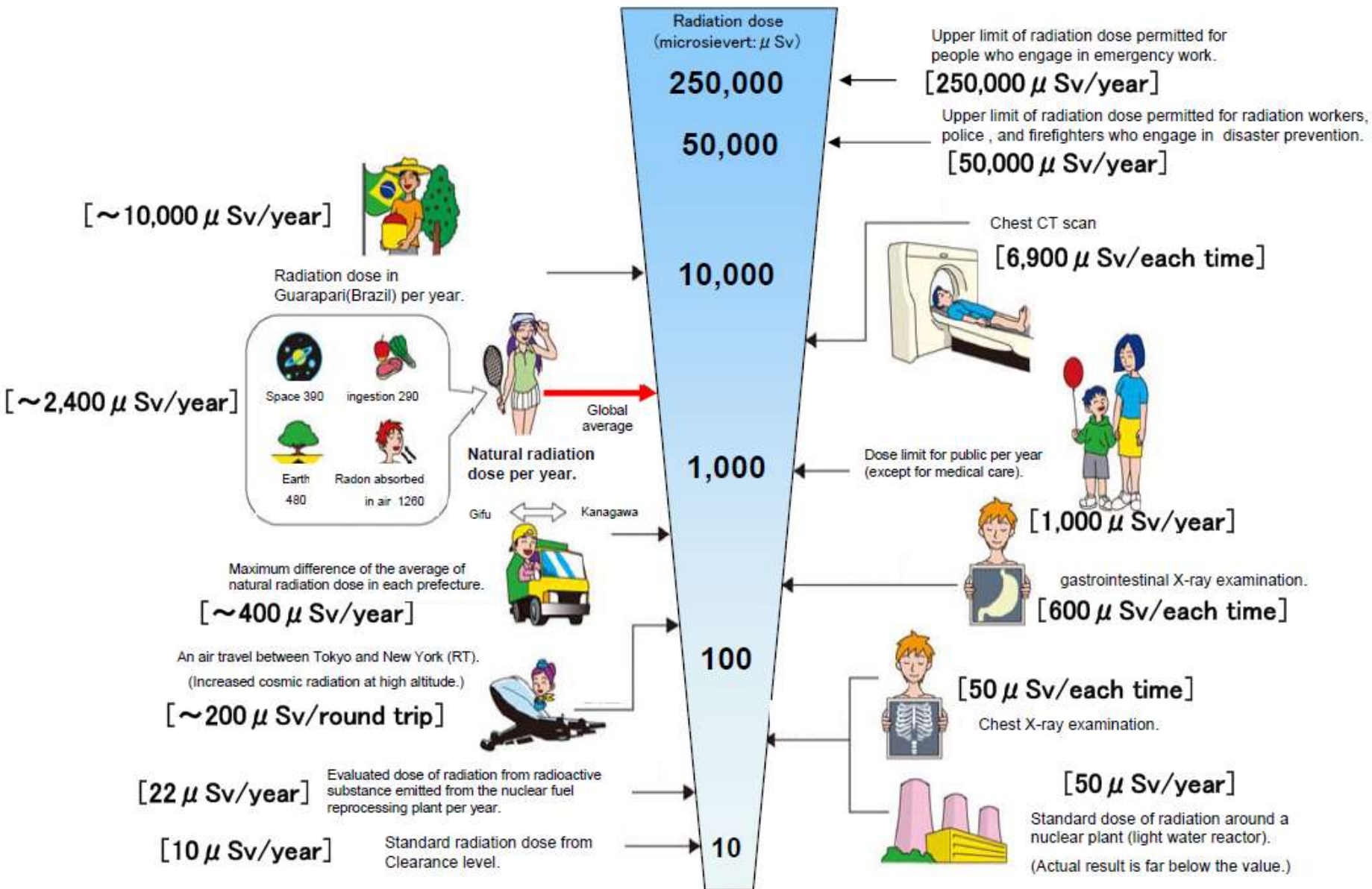
<extracts>

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>



# 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  $\gamma$  ray.

## 4. Decontamination

The decontamination process has gone under way in Fukushima Prefecture. Replacement of soils in school fields, parks and farm lands, and using high-pressure water cleaners to decontaminate roofs, gutters and walls of houses are being conducted.

Replacement of soils



High-pressure water cleaners

