

# Additional requirements and taken countermeasures after the Fukushima accident to restart NPPs.

1

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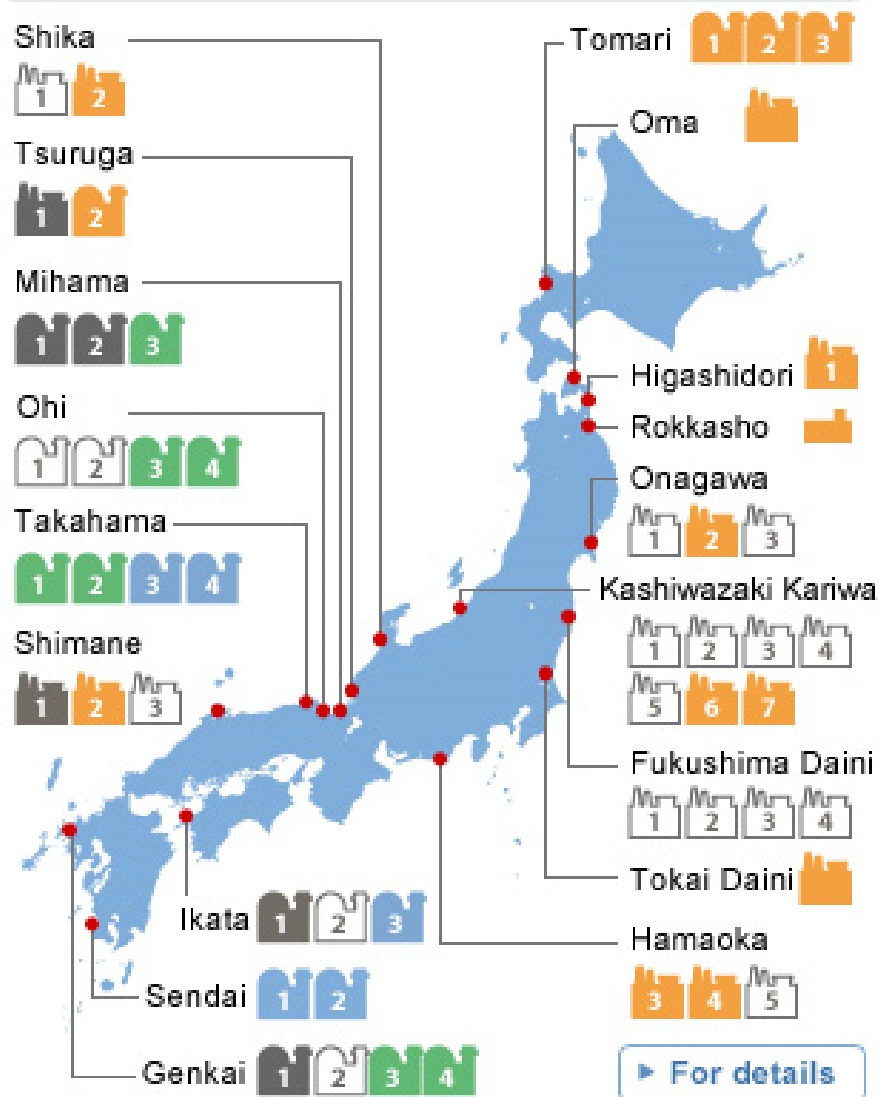


Additional regulatory requirements, set forth by the Nuclear Regulation Authority (NRA), were put into effect in July 2013.

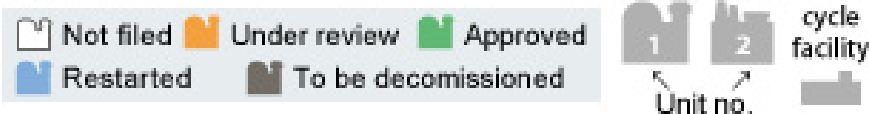
Status of the Japanese nuclear power plants (except Fukushima Daiichi) as of May 2017 is;

- Restarted: 5 NPPs
- License approved: 7 NPPs
- Under review: 14 NPPs
- To be decommissioned: 6 NPPs
- Not filed: 18 NPPs

### Licensing status of the Japanese nuclear facilities



#### Legend



For details:  
<http://www.genanshin.jp/english/facility/map/>

## Licensing status for the Japanese nuclear facilities

The new safety regulation was established in 2013 to include the TEPCO Fukushima Daiichi NPP accident lessons learned and opinions/proposals from inside and outside of Japan. Each utility's reactor installation and operation are to be evaluated in accordance with this regulation.

Currently, multiple NPPs and other nuclear facilities, e.g. fuel cycle facilities are undergoing a safety review conducted by the Nuclear Regulation Authority (NRA).

The review mainly targets three items submitted by respective utilities, which is 1) change in reactor installation, 2) construction plan and 3) operational safety programs, and the following chart shows the progress of the NRA review on reactor installation change.

As of May 24, 2017

\*The date the utility announced decommissioning

Company	Reactor unit	Reactor type	Permission for change in reactor installation				Restart Restarted on	Notes
			Filed?	Filed on (y/m/d)	Status	Approved on		
Hokkaido	<a href="#">Tomari 1</a>	P	Yes	2013.7.8	In review			
	<a href="#">Tomari 2</a>							
	<a href="#">Tomari 3</a>	P	Yes	2013.7.8	In review			
Kansai	<a href="#">Mihama 1</a>	P	-	-	-	-	-	(2015.3.17) *
	<a href="#">Mihama 2</a>	P	-	-	-	-	-	(2015.3.17) *
	<a href="#">Mihama 3</a>	P	Yes	2015.3.17	Approved	2016.10.5		
	<a href="#">Takahama 1</a>	P	Yes	2015.3.17	Approved	2016.4.20		
	<a href="#">Takahama 2</a>	P	Yes	2015.3.17	Approved	2016.4.20		
	<a href="#">Takahama 3</a>	P	Yes	2013.7.8	Approved	2015.2.12	2016.1.29	2016.1.29 Reactor start-up
	<a href="#">Takahama 4</a>	P	Yes	2013.7.8	Approved	2015.2.12	2016.2.26	2016.2.26 Reactor start-up

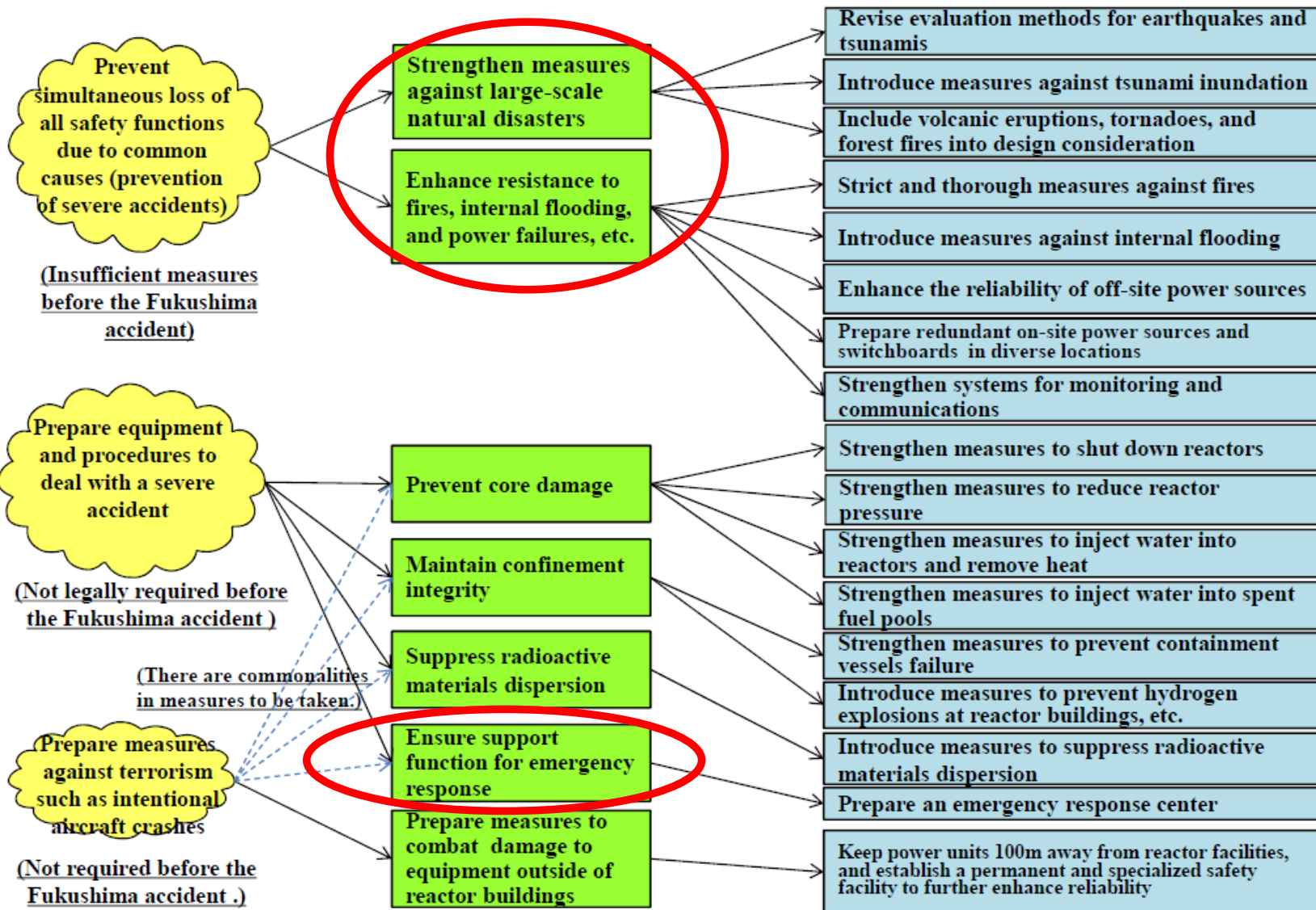
# Additional Regulatory Requirements

[Major objective]

Expanding coverage to include severe accidents and introducing an enhanced countermeasure provision that additional requirements can be applied retroactively to new and existing nuclear facilities.

# New Regulatory Policies and Major Requirements

➤ Establish measures to prevent loss of safety functions due to common causes and spread of severe accidents

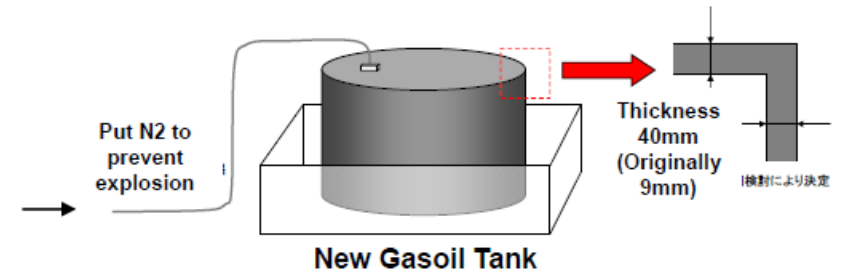


# Countermeasures to prevent external events

Measures against tsunami (15m)  
Tidal Embankments, Walls, Boards,  
Water Tight Doors, etc.

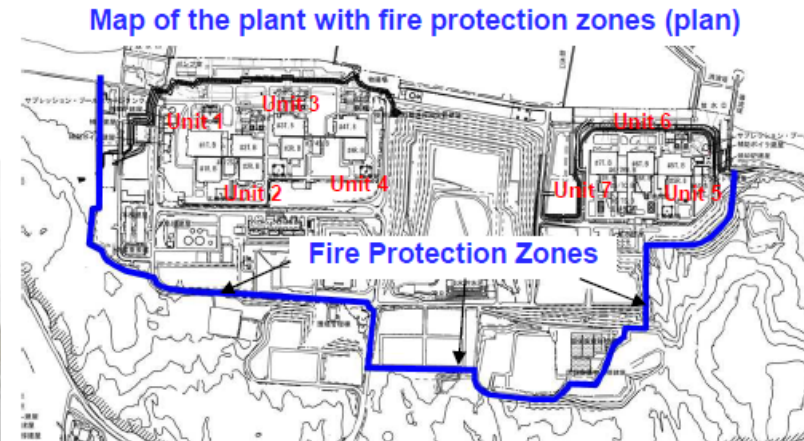


Measures against Tornado (Fujita Scale 2)  
Replacement of the gasoil tanks



Measures against External (Forest)  
Fire

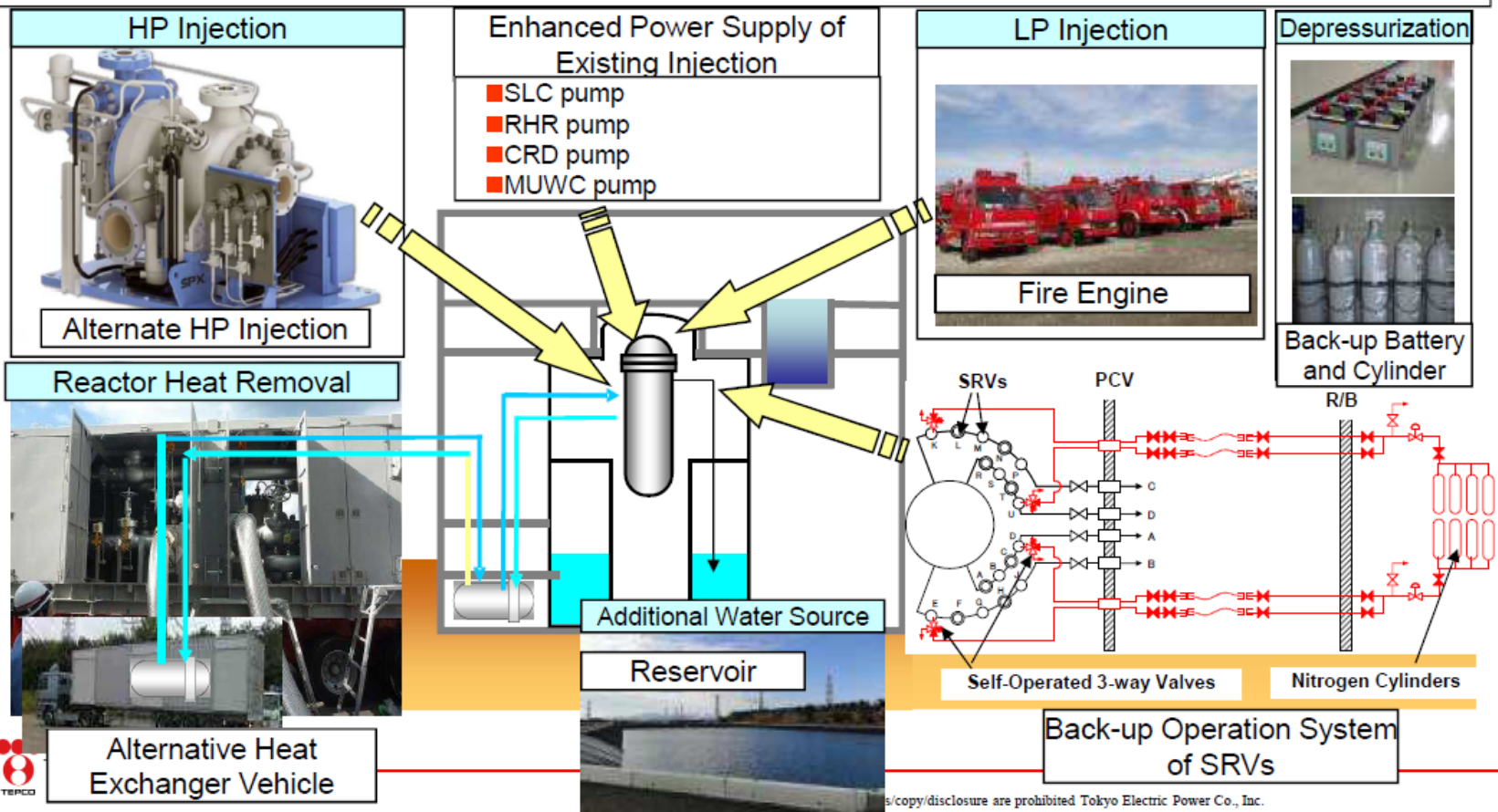
Creation of the fire protection zones(20m)



# Enhanced measures to control accidents

## Water Injection and Heat Removal Functions

- Enhance High Pressure Injection Function: High Pressure Alternate Cooling System
- Enhance Depressurization: Back-up Operation System of SRVs
- Additional Water Source: Reservoir
- Enhance Heat Removal Function: Alternative Heat Exchanger Vehicle



# 2017 ISOE ATC Benchmarking Exchange for Radiation Protection

## ALARA Self-Evaluation and Optimization Plan for Radiation Protection

Date: from 25th October 2017 to 27th October 2017.

Venue: Maizuru Grand Hotel,

Tahakama Nuclear Power Plant (The Kansai Electric Power Co., Inc.),

Nuclear Power Training Center, Ltd.,

Nuclear Emergency Assistance Center (The Japan Atomic Power Company).

8





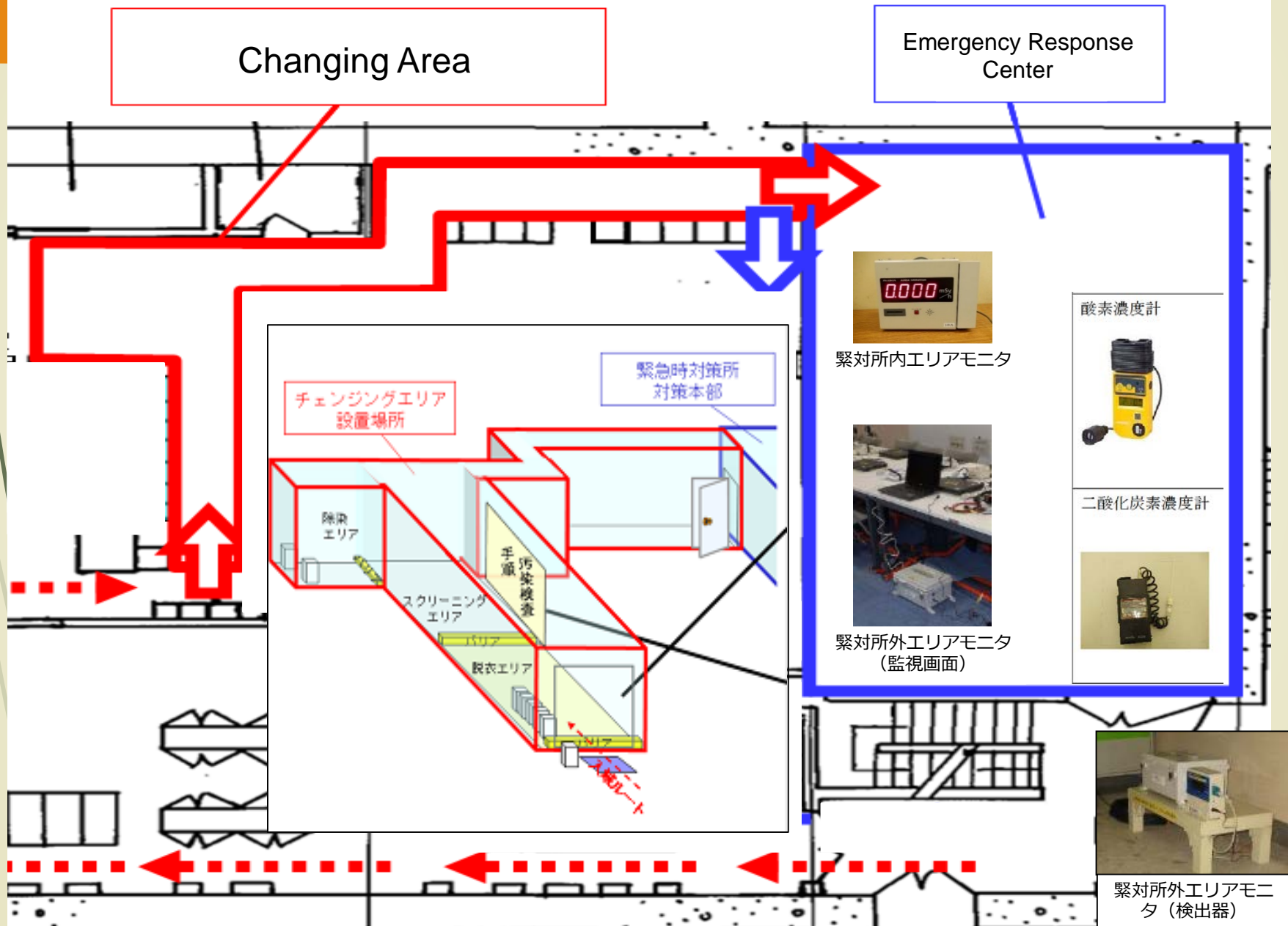
## Program

- 1) Introduction of ISOE Standards (based on a relevant material of ISOE website).
- 2) Introduction of Radiation Protection Planning at the site of Takahama NPP.
- 3) Comparisons with ISOE Standards (Group discussions).
- 4) Visit Takahama NPP and its Facilities related to Radiation Protection.
- 5) Emergency Response and Preparedness (incl. visiting related facilities at Takahama NPP).
- 6) Technical Visit to Nuclear Power Training Center and Nuclear Emergency Assistance Center.



# Emergency Response Center at Takahama NPP

(Environmental radiation monitoring, prevention of contamination, etc.) ©KEPCO



# Nuclear Emergency Assistance Center (The Japan Atomic Power Company)



11



# Role of Nuclear Emergency Assistance Center

**Mission:** Based on lessons learnt from the Fukushima Daiichi accident, develop an emergency response organizations capable for diverse and severe disasters in a high-dose environment.

## **Basic roles: Protect personnel from radiation as much as possible**

During restoration from an accident in a high-dose environment, [engage in emergency response activities in cooperation with a utility of the relevant facility](#) to perform reconnaissance of on-site conditions, to measure the air dose rate, and to remove rubble using remote-controlled equipment such as drones, robots and crane trucks.

- Main activities based on basic roles:  
Activities in emergencies and activities in normal times to secure/maintain the effectiveness of emergency response.

### **Activities in emergencies**

- [Robot operation, support](#)
- Personnel, equipment transfer
- Equipment procurement, repair

### **Activities in normal times**

- [Education, training for utility and support organization personnel](#)
- Coordination with related authorities
- Maintenance (servicing and inspection) of necessary equipment in preparation for emergencies

# Outline of Nuclear Emergency Assistance Center

- ◆ In the event of a nuclear disaster, immediately organize emergency mobilized teams, dispatch and transfer personnel and equipment to the utility experiencing an accident, and respond to the high-dose environment nuclear disaster in cooperation with the relevant utility.
- ◆ In normal times, prepare and manage remote-controlled robots, etc. intensively so as to apply them in nuclear disaster response, and provide nuclear utility personnel with training to operate them.

## Support organization (Fukui)

In normal times



- Personnel training/development
- Secure an emergency communication system
- Manage, maintain, and improve equipment

During a nuclear disaster

Request mobilization



Understand accident situation

Assemble personnel  
(Organize emergency mobilized teams)



Emergency mobilization  
(Dispatch and transfer personnel/equipment)



## Power station where accident occurs

Radio-controlled helicopter



Collect information  
indoors and outdoors

Small robot



Heavy machinery



Remove obstacles,  
rubble



Personnel/  
Equipment

## Disaster response support base

Equipment vehicle



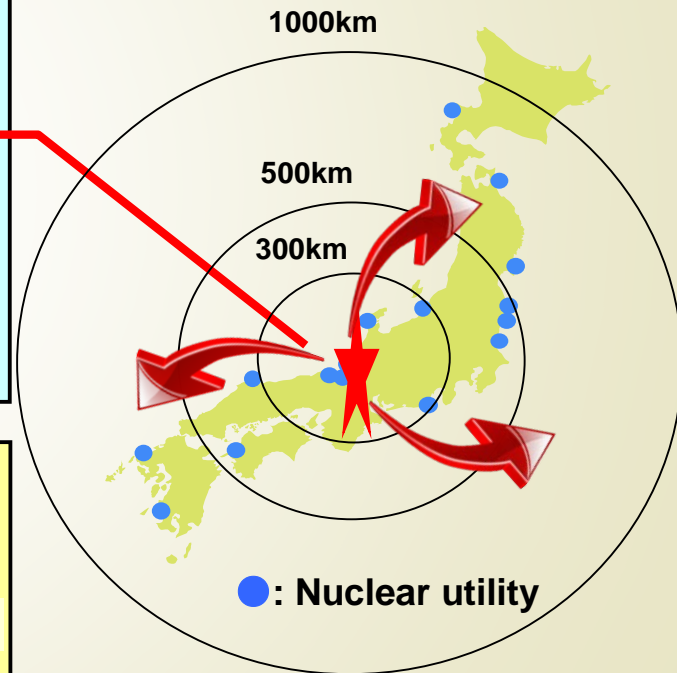
Personnel transporter



Fuel transporter



- Equipment and personnel hub
- Comprehensive supervision of the accident site
- Equipment repair





Vehicle for operation



Inside view of the vehicle

14



Remote controlled crane truck

Thank  
you

