

Current Status and Challenges at Fukushima Daiichi Decontamination and Decommissioning

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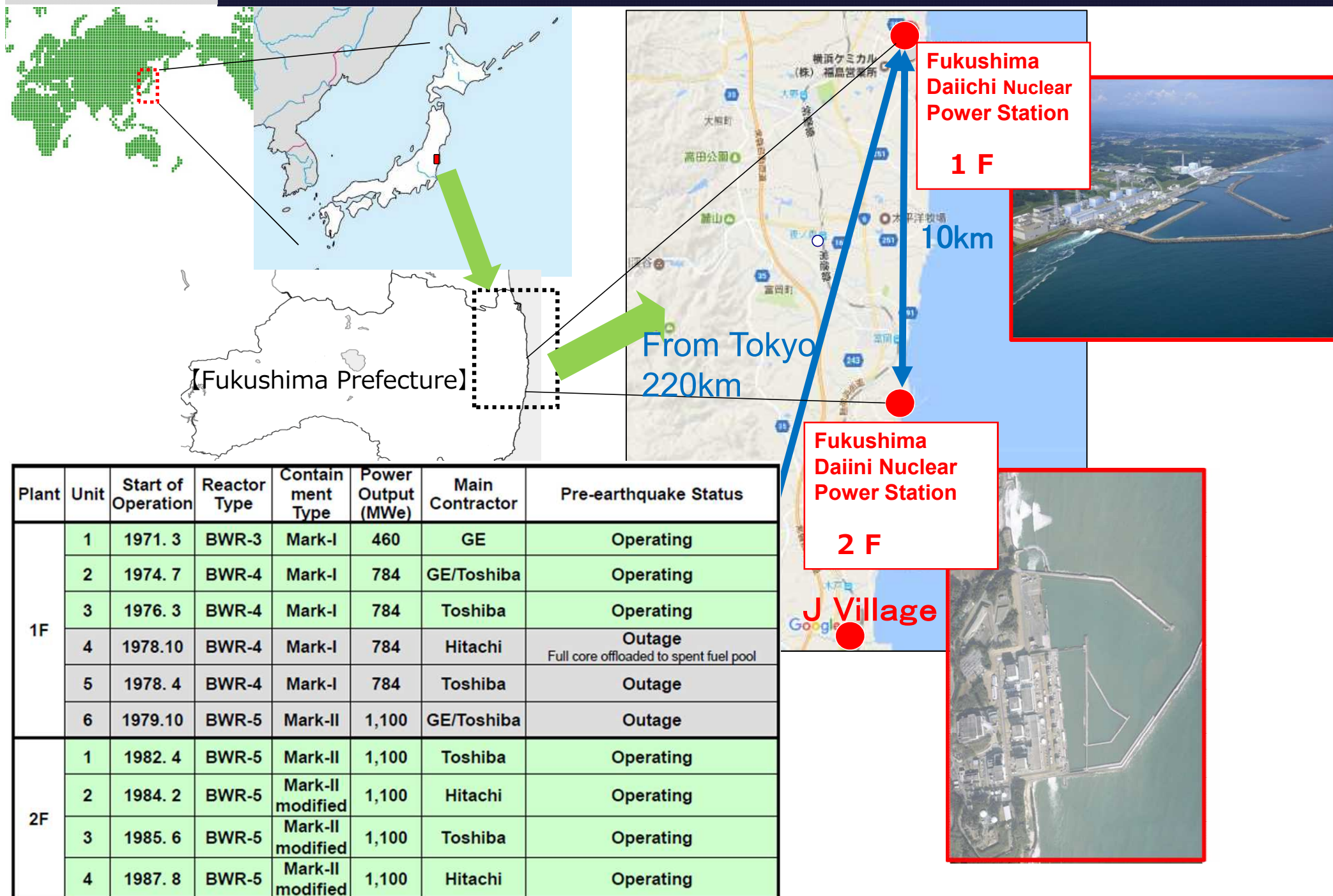
March 2, 2017

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**President of Fukushima Daiichi Decontamination and
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TEPCO





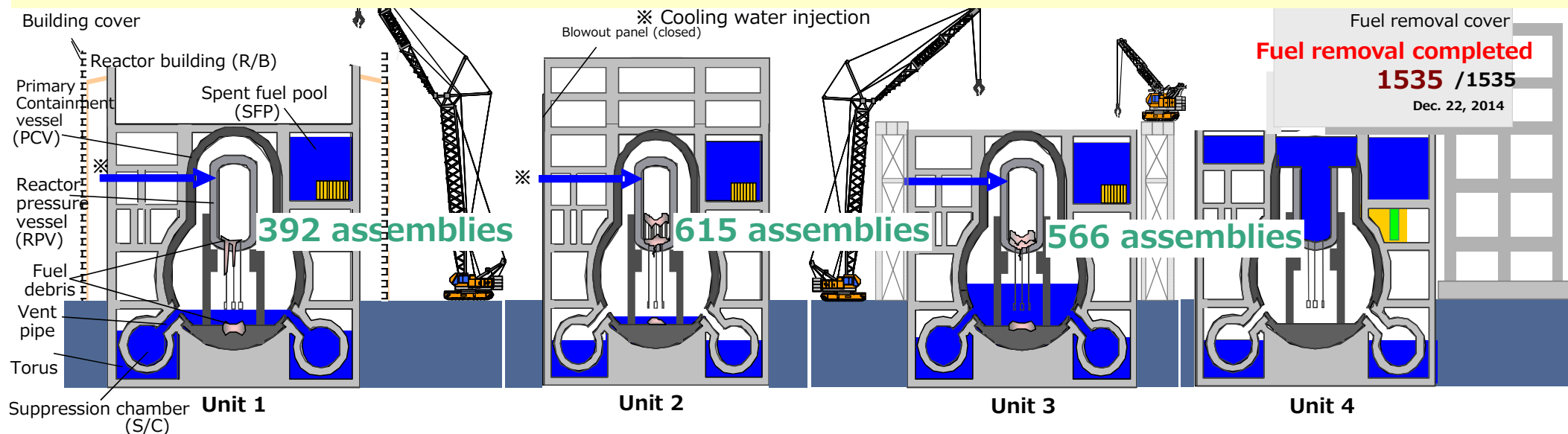
Today's Topics

- 1. Current Status of Fukushima Daiichi NPS**
- 2. Improving Work Environment**
- 3. Three Policies for Measures to Counter Contaminated Water**
- 4. Fuel Removal from the Spent Fuel Pools**
- 5. Toward Fuel Debris Removal**
- 6. Information Sharing and Communication**

A photograph of the Fukushima Daiichi Nuclear Power Station construction site. In the foreground, two large red lattice cranes are visible on the left. In the center, a large, dark, rectangular structure, possibly a containment dome or a large container, is being lifted by a crane. To the right, a tall, white, cylindrical structure, likely a containment vessel, is visible. The background shows a cloudy sky and the ocean.

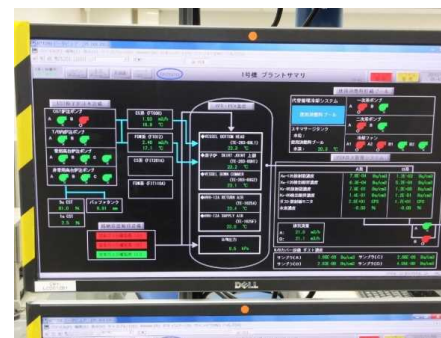
1. Current Status of Fukushima Daiichi NPS

- Cold shutdown of all units continues to be maintained.
- Plant parameters including RPV and PCV temperatures are monitored continuously 24 hours/day






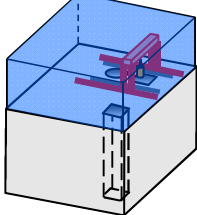


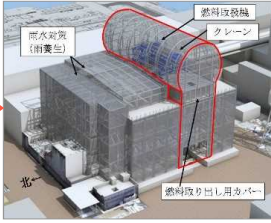





Values as of 11:00 am on February 22, 2017

	Temperature at the bottom of the pressure vessel	Temperature inside the containment vessel	Fuel pool temperature	Reactor coolant volume
Unit 1	14°C	15°C	24°C	3.0 m ³ /hour
Unit 2	18°C	19°C	26°C	4.5 m ³ /hour
Unit 3	17°C	18°C	26°C	3.2 m ³ /hour
Unit 4	—	—	14°C	—

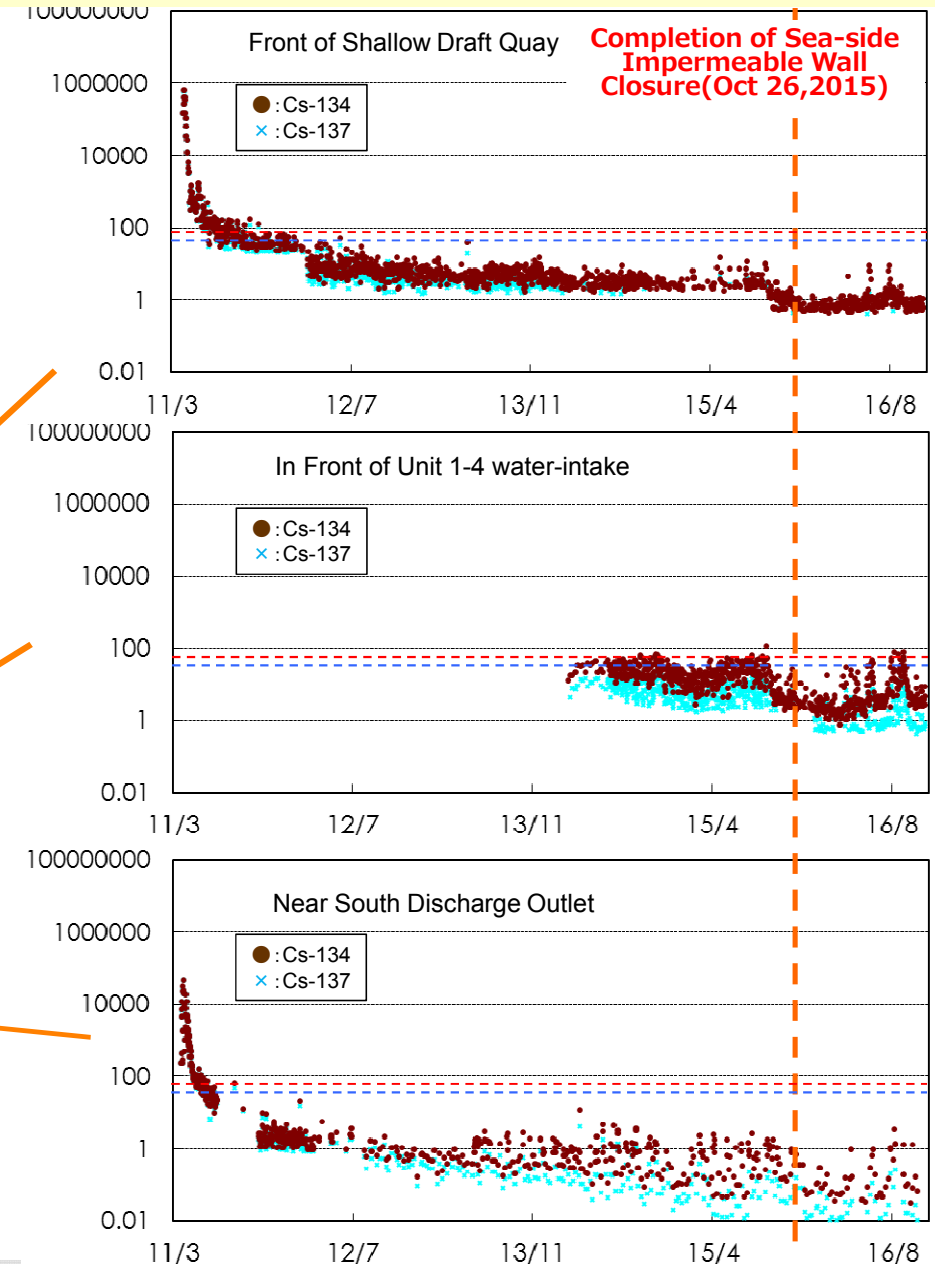
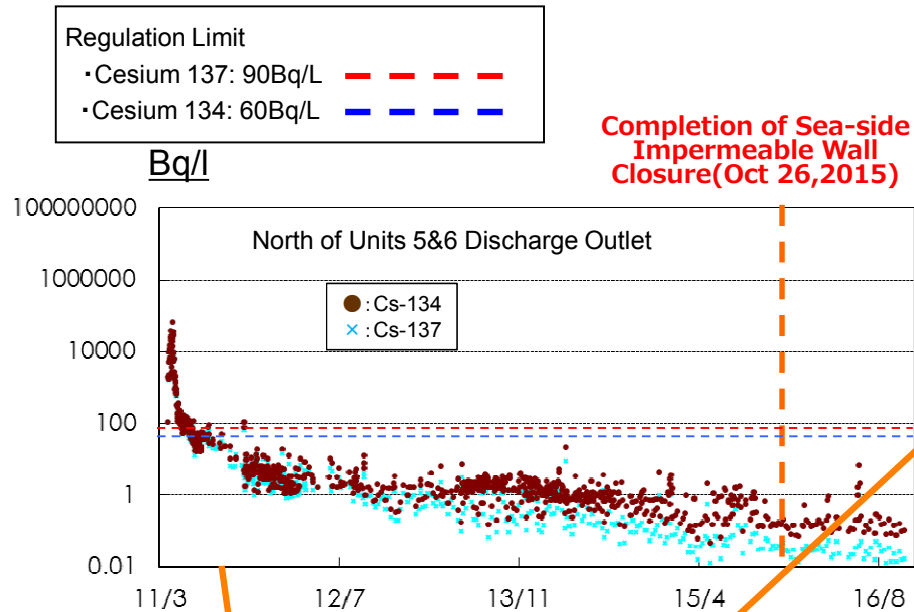


(2) Current status and tasks of Units 1–4

Unit 1	<div>Current status</div> <div>Tasks</div>	<ul style="list-style-type: none"> Removal of building cover toward removal of fuel from spent fuel pool was completed (November 2016) Investigation of rubble status on refueling floor and inside pool. Countermeasures for dispersion of radioactive materials 	<p>Immediately after the accident</p> 	<div>October 2011</div> <div>After the Removal of Cover</div>  
Unit 2	<div>Current status</div> <div>Tasks</div>	<ul style="list-style-type: none"> Blowout panel closed Very high radiation level in the building As preparation for fuel removal, gantries are being built Demolition of upper building is planned 		<div>Now</div> <div>Blueprint (Fuel Handling Machine)</div>  <p>Gantries are being installed</p> 
Unit 3	<div>Current status</div> <div>Tasks</div>	<ul style="list-style-type: none"> Decontamination and shielding on the refueling floor is complete Installation of fuel removal cover started in Jan, 2017 Girders for Fuel Handling Machine to be installed in March 2017 		<div>Now</div> <div>Blueprint</div>  
Unit 4	Current status	<p>Fuel removal from SFP completed (commenced November 18, 2013, completed December 22, 2014)</p>		<div>Cantilever structure installed</div> <div>Removal of SF assemblies</div>  

- Compared to the situation just after the accident, the current level of radioactivity has been lowered to parts per hundred thousand, to per million.
- Concentration levels decreased further after closure of the sea-side impermeable wall.

- The concentrations outside the port are substantially below regulation limits



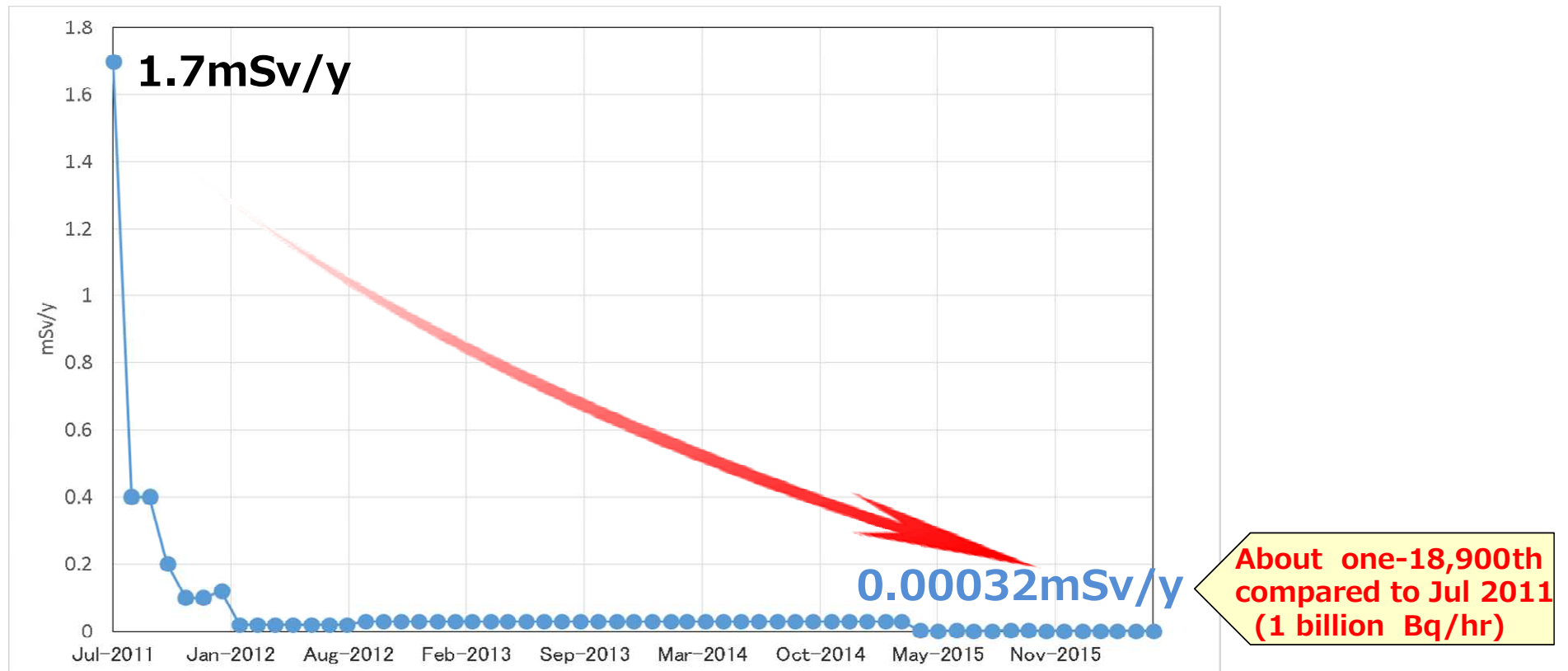
■ Release of radioactive materials has significantly decreased

Amount of radioactive materials (cesium) released from Unit 1-4 PCVs is assessed based on airborne radioactive material concentrations at top of reactor buildings

Estimated value of total release amount (as of August 2016) about 53 thousand Bq/hr

- Accordingly, assessed the exposure dose at site boundary as maximum 0.00032 mSv/yr
(Excluding effect of already released radioactive materials)

Exposure dose by radioactive materials (cesium) from Units 1 to 4



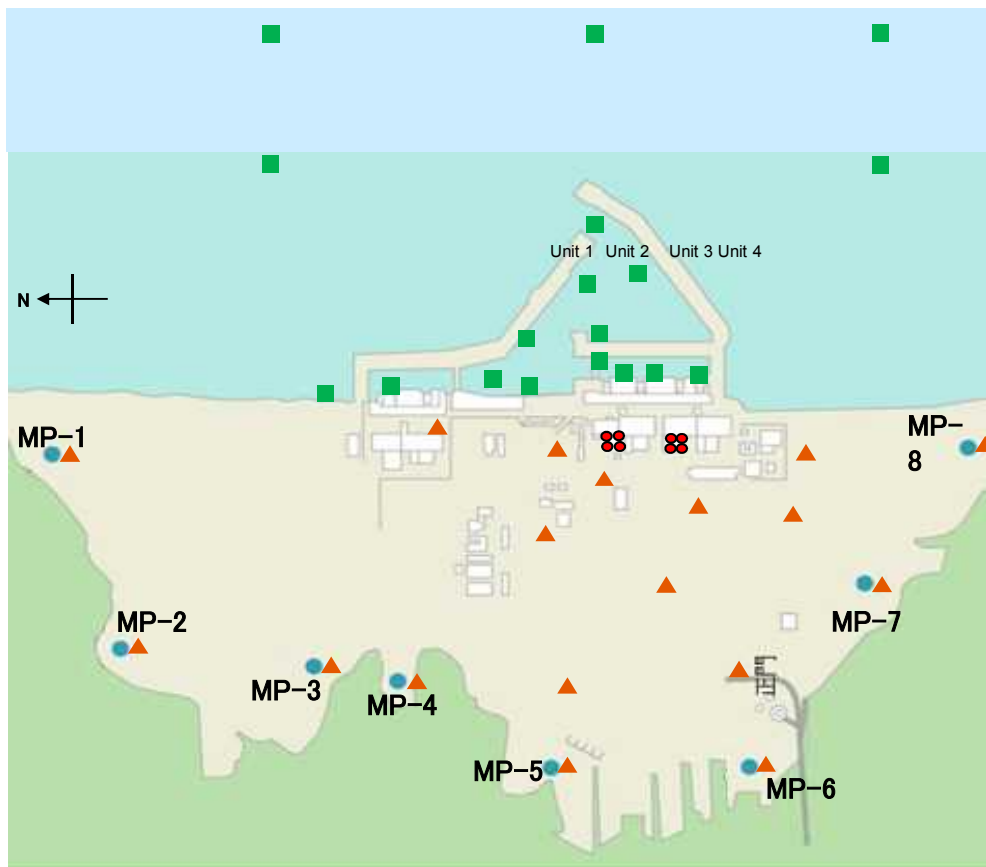
A photograph of an industrial facility, possibly a refinery or chemical plant, with several workers in blue protective suits and hard hats. They are working on a large, dark, textured surface, likely a floor or a large tank. The background shows complex industrial structures and pipes. The image has a blue tint.

2. Improving Work Environment

- In order to make workers feel secure, display monitors showing real-time dose-rate have been placed at the seismic isolation building etc.

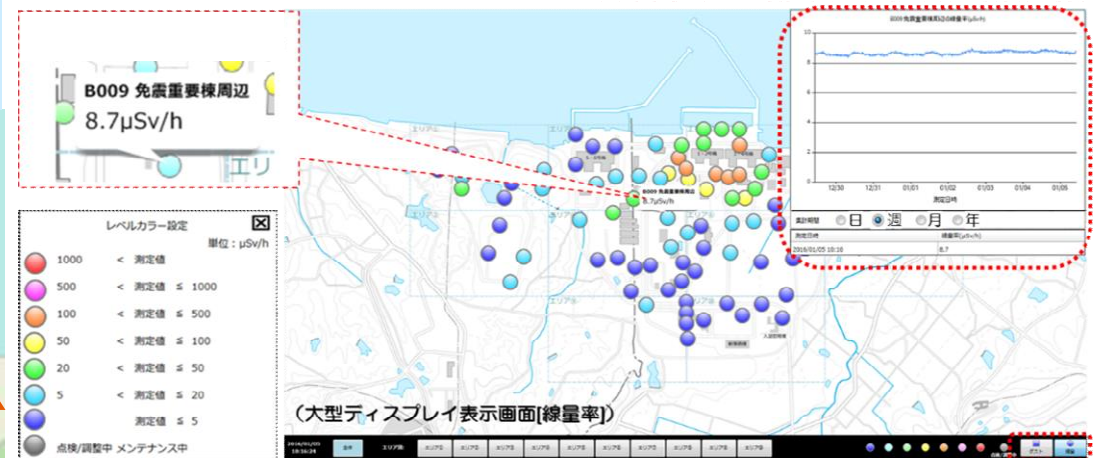
Location of sampling points, dust monitors and monitoring posts

- Dust monitors on the refueling floor
- Monitoring Post
- Dust Monitors
- Sampling points in the sea area



Installation of dose-rate monitors

- System visualizing real time dose data in place.
- Data display monitors (86 points) placed where workers can easily access. Continuous dust monitoring data also shown on display.



(2) Decreasing Site Radiation Dose

- As a result of radiation reduction measure, workers don't have to wear full-face respirator or half-face respirator anymore in most parts of the site.

Decreasing radiation dose

FY2013

40 %

FY2014

77 %

As of Dec. 2015

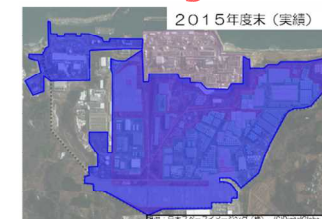
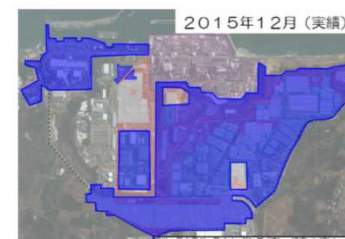
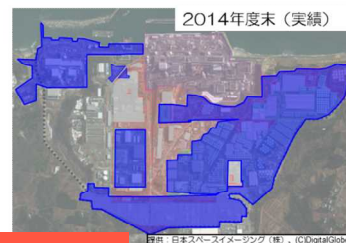
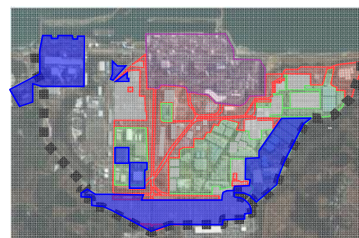
89 %

As of Mar. 2016




100 %

FY2015 Target Achieved

 : Area confirmed below 5 μ Sv/h



Personal protective equipment in each zone

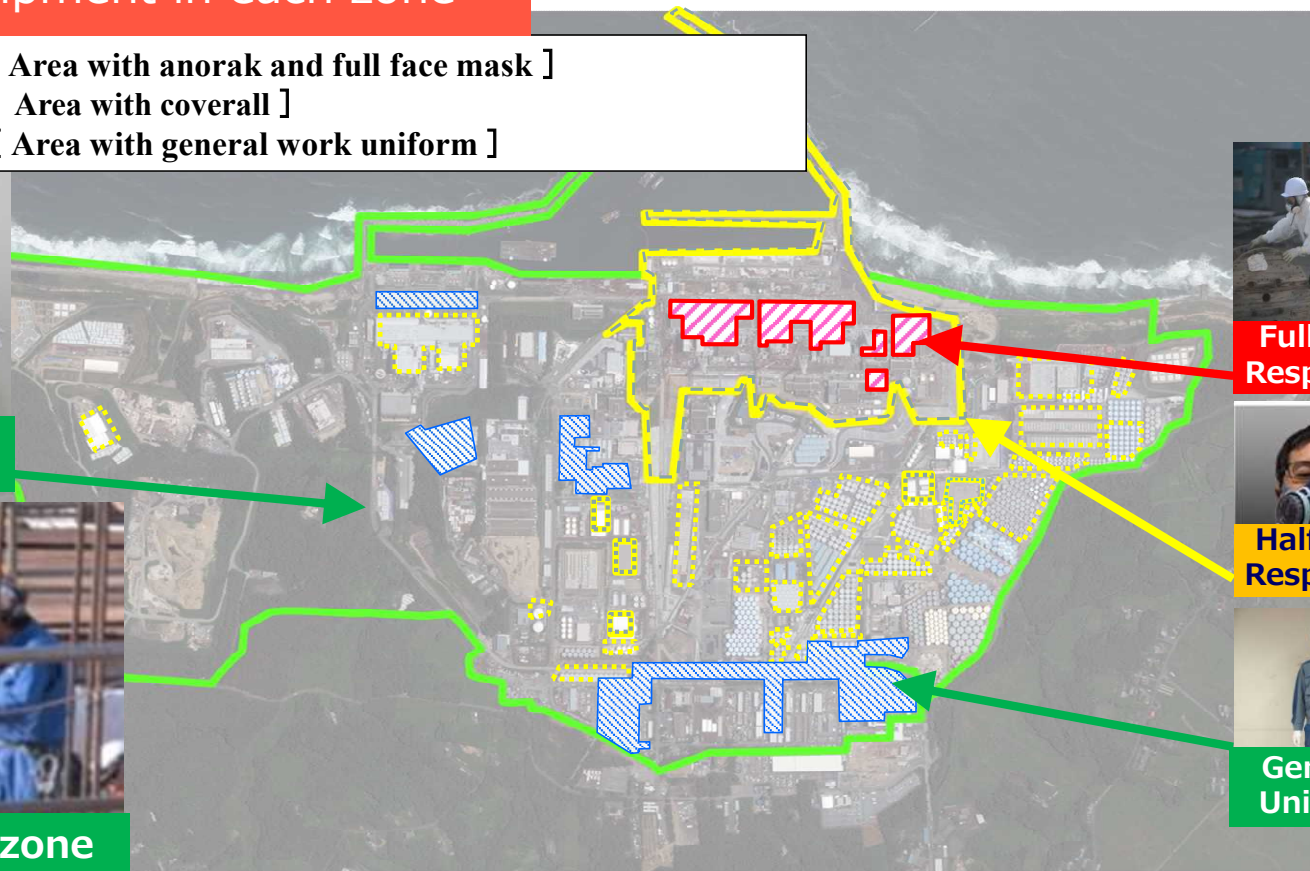
-  R zone [Area with anorak and full face mask]
-  Y zone [Area with coverall]
-  G zone [Area with general work uniform]



Green zone equipment



Workers in the G zone



Full-face Respirator



Half-face Respirator

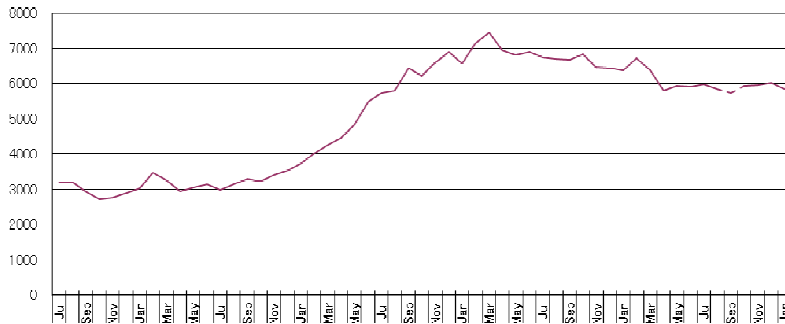


General Uniform

- Currently about 6,000 persons/day are working on weekdays, which is twice as many as several years ago.
- Facilities such as Contractors' Office Building have created the environment where TEPCO and contractors can address the decommissioning work in an integrated manner.

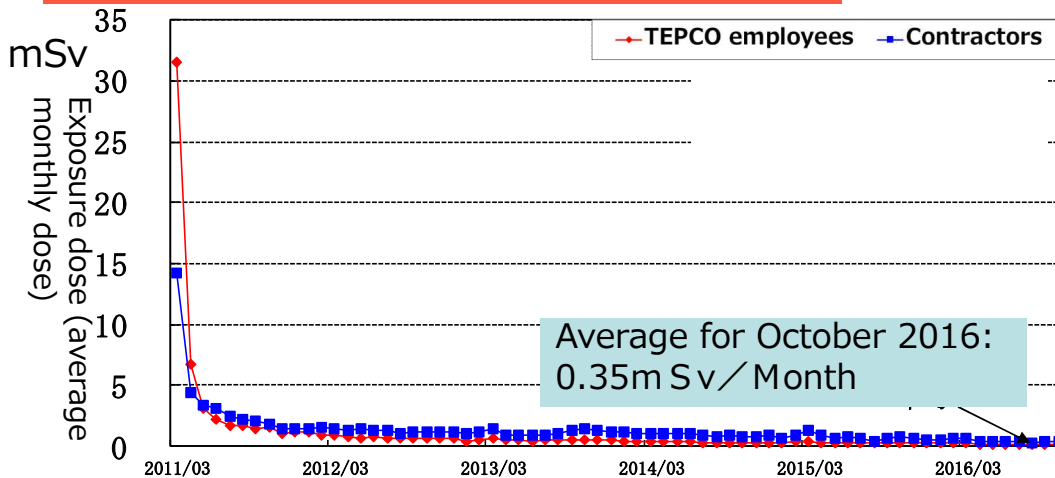
Changes in number of workers

- Number of workers (TEPCO employees and contractors) per weekday engaged in work during October assumed as approx. 5,850 people as of Jan. 2017.
- Percentage of workers from local area approx. 55% as of Jan. 2017.



Change in the average number of workers (actual value) per weekday in the months following 2012.

Trend of monthly exposure dose rate



New Facilities

- Large rest house with a capacity of approx. 1,200 workers (from May 2015)
→Convenience store "Lawson" opened in March, 2016
- Fukushima Revitalization Meal Service Center (from March 2015)
 - Providing warm meals to Fukushima Daiichi
 - Creation of employment opportunities
 - Dispelling harmful rumors about Fukushima food
- Contractors' Office Building which opened in Feb. 2017 is located in the vicinity of TEPCO's office building, which allows them to work closely.

Large Rest House



Contractors' Office Building

New Office Building for TEPCO

Ensuring stable long-term employment

- Currently, more than 90% of orders fulfilled by negotiated contracts, which enables contractors to secure workers in a long term.

Pursuit of safety on-site

- On January 19, TEPCO and contractors jointly held a congress to pledge for no human-caused accident to happen.

