

# Change of the Rules Related to Radiation Protection Gear (Expansion of Area Allowing the Use of Mask with a Dust Filter Attached)

## 1. Outline

Though workers are currently required to wear a mask with a charcoal filter attached when working in Units 1-4 and the surrounding buildings at Fukushima Daiichi Nuclear Power Station, the area allowing the use of mask with a dust filter attached (which is lighter than that with a charcoal filter and allows to breathe more easily) will be expanded for the purpose of mitigating the burden on the workers and improving workability, while continuing thorough radiation control.

## 2. Expansion of the area allowing the use of mask with a dust filter attached

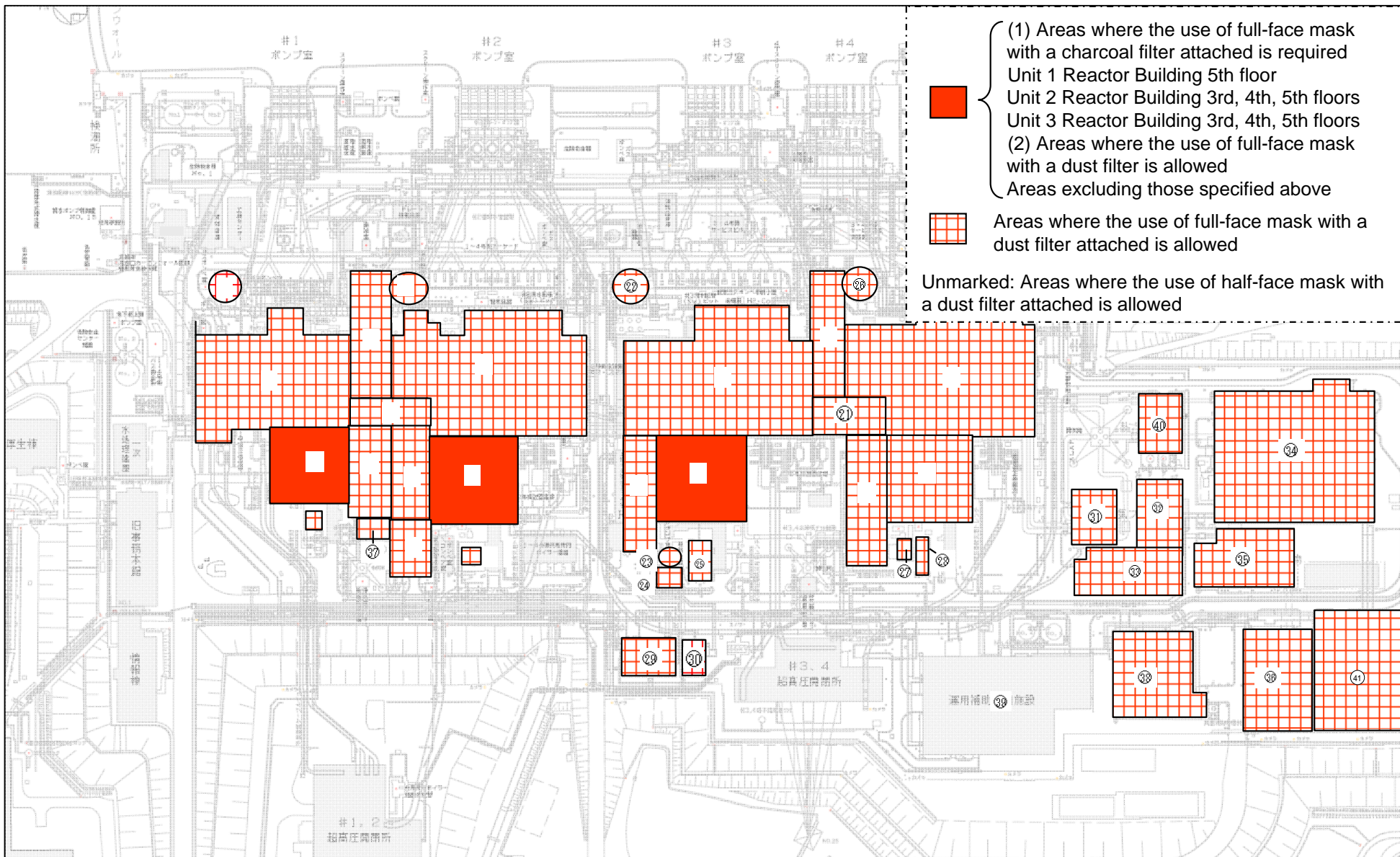
Initially, the use of mask with a dust filter attached was allowed in the areas excluding Units 1-4 and the surrounding buildings (that is, the entire outdoor area, in Units 5-6, etc.). The area allowing the use of mask with a dust filter attached has been expanded to all areas except for some areas of Units 1-3 Reactor Building (Unit 1: 5th floor, Unit 2: 3rd, 4th and 5th floors, Unit 3: 3rd, 4th and 5th floors).

## 3. Effective date of the area expansion: December 19, 2012

< Attachments >

1. Radiation protection mask usage map
2. Specifications of charcoal filter and dust filter
3. Radioactivity density measurement results of the air within the grounds of Fukushima Daiichi Nuclear Power Station
4. Radioactivity density measurement results of the air in Units 1-4 and the Central Environmental Facility Building (June-August, 2012)











# Radiation Protection Mask Usage Map



- (1) Areas where the use of full-face mask with a charcoal filter attached is required
  - Unit 1 Reactor Building 5th floor
  - Unit 2 Reactor Building 3rd, 4th, 5th floors
  - Unit 3 Reactor Building 3rd, 4th, 5th floors
- (2) Areas where the use of full-face mask with a dust filter is allowed
  - Areas excluding those specified above
- Unmarked: Areas where the use of half-face mask with a dust filter attached is allowed

- |  |  |  |   |
|--|--|--|---|
| 1: Unit 1 Reactor Building               | 14: Unit 3 Reactor Building              | 27: Unit 4 waste liquid storage tank                         | 38: Miscellaneous Solid Waste Volume Reduction Treatment Building |
| 2: Unit 1 Turbine Building               | 15: Unit 3 Turbine Building              | 28: Unit 4 FSTR Building                                     | 39: Auxiliary Operation Shared Facility                           |
| 3: Unit 1 Waste Treatment Building       | 16: Unit 3 Waste Treatment Building      | 29: Units 1-2 Activated Carbon Hold-up Equipment Building    | 40: Central Radioactive Waste Treatment Facility Building         |
| 4: Unit 2 Reactor Building               | 17: Unit 4 Reactor Building              | 30: Unit 3 Activated Carbon Hold-up Equipment Building       | 41: Temporary Storage Building for SARRY/KURION Vessels           |
| 5: Unit 2 Turbine Building               | 18: Unit 4 Turbine Building              | 31: Main Exhaust Fan Building                                |   |
| 6: Unit 2 Waste Treatment Building       | 19: Unit 4 Waste Treatment Building      | 32: Flammable Miscellaneous Solid Waste Incinerator Building |   |
| 7: Units 1-2 Service Building            | 20: Units 3-4 Service Building           | 33: Working Machine Building                                 |   |
| 8: Units 1-2 Control Building            | 21: Units 3-4 Control Building           | 34: Central Waste Treatment Building                         |   |
| 9: Unit 1 condensate water storage tank  | 22: Unit 3 condensate water storage tank | 35: On-site Bunker Building                                  |   |
| 10: Unit 1 waste liquid storage tank     | 23: Unit 3 waste liquid storage tank     | 36: Common Suppression Pool Water Surge Tank Building        |   |
| 11: Unit 2 condensate water storage tank | 24: Unit 3 shower/laundry tank           | 37: Units 1-2 Shower Drain Tank Building                     |   |
| 12: Unit 2 waste liquid storage tank     | 25: Unit 3 FSTR Building                 |  |   |
| 13: Units 1-2 FSTR Building              | 26: Unit 4 condensate water storage tank |  |   |

**Specifications of the charcoal filter and dust filter**

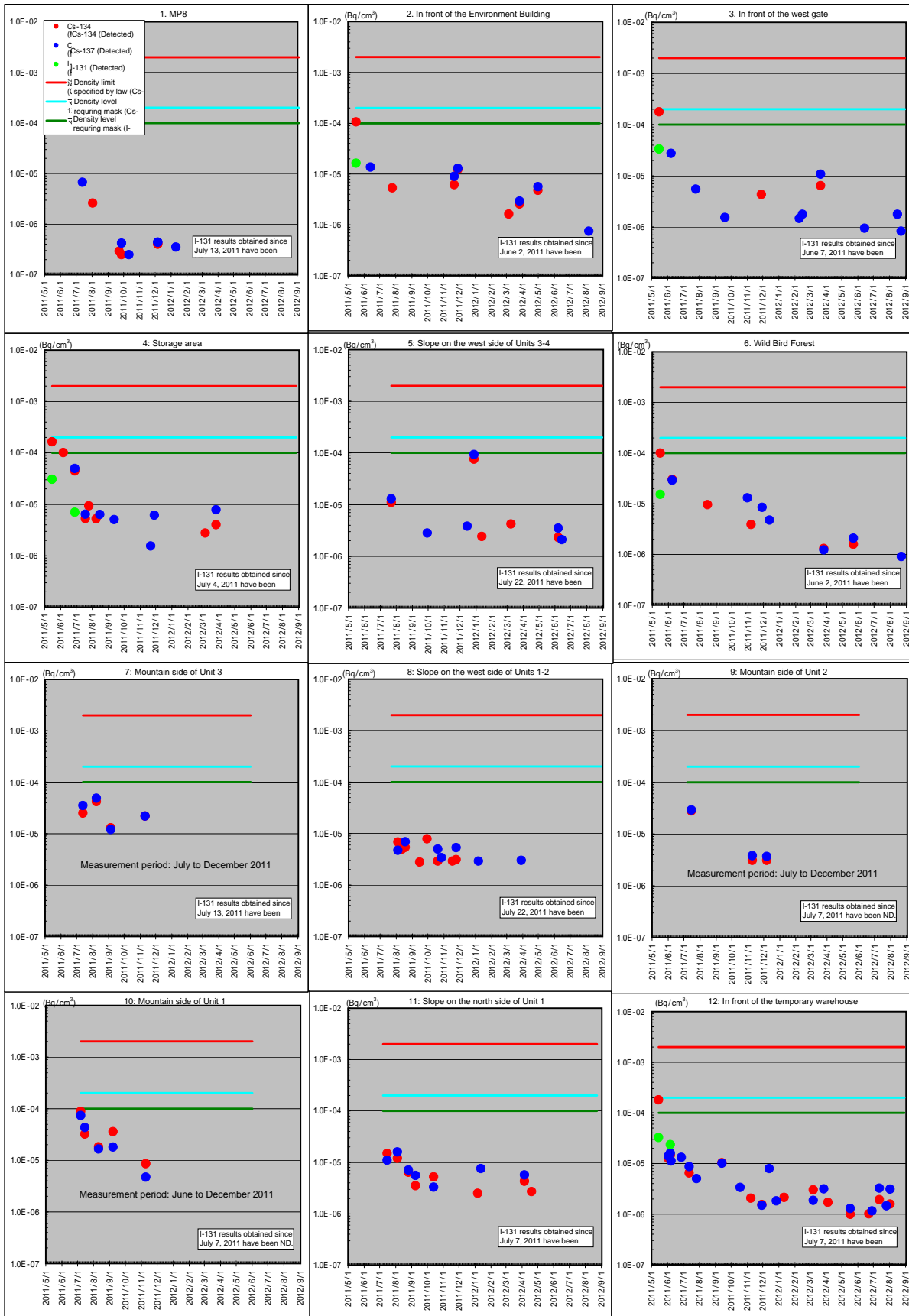
	Charcoal filter		Dust filter		
	Full-face mask	Filter	Full-face mask	Half-face mask	Filter
Appearance					
					
Specification	<p>[Structure] - HEPA filter (Glass fiber) - TEDA impregnated activated carbon</p> <p>[Particle collection efficiency] 99.9% (0.3 μ m particle)</p> <p>[Inhalation resistance] Approx. 150Pa</p> <p>[Total weight (Full-face mask and charcoal filter)] Approx. 500g</p>		<p>[Structure] - HEPA filter (Glass fiber)</p> <p>[Particle collection efficiency] 99.9% (0.3 μ m particle)</p> <p>[Inhalation resistance] Approx. 100Pa</p> <p>[Total weight (Full-face mask and dust filter)] Approx. 400g</p> <p>[Total weight (Half-face mask and dust filter)] Approx. 160g</p>		
	<p>Reduced by 33%</p> <p>Reduced by 20%</p> <p>Reduced by 68%</p>		<p>Reduced by 20%</p>		

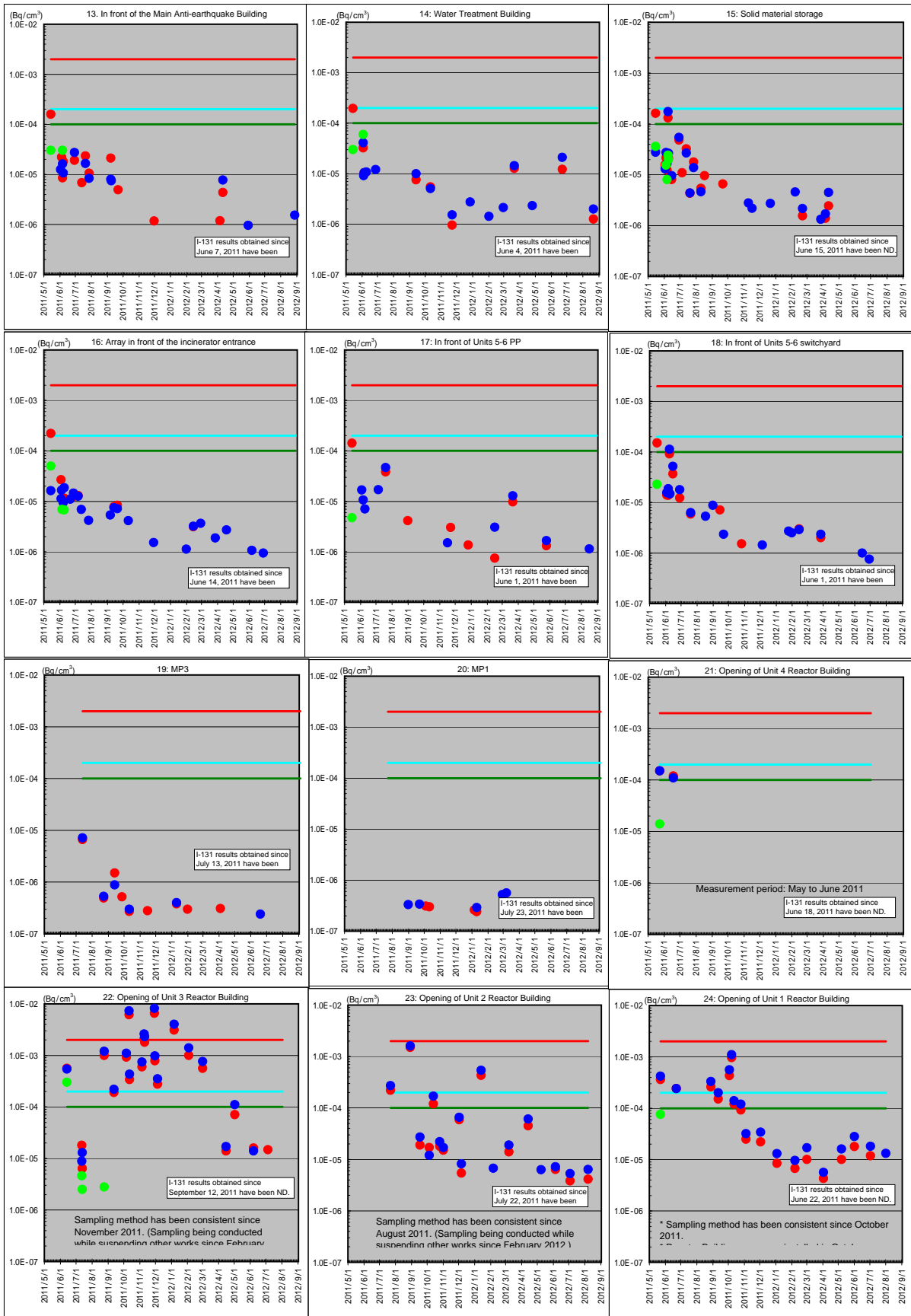
(Reference) Inhalation resistance of surgical mask: Approx. 40Pa

Radioactivity density measurement results of the air within the grounds of Fukushima Daiichi Nuclear Power Station



- |   |   |  |
|---|---|--|
| 1: MP8                                  | 9: Mountain side of Unit 2                        | 17: In front of Unit 5-6 PP            |
| 2: In front of the Environment Building | 10: Mountain side of Unit 1                       | 18: In front of Unit 5-6 switchyard    |
| 3: In front of the west gate            | 11: Slope on the north side of Unit 1             | 19: MP3                                |
| 4: Storage area                         | 12: In front of the temporary warehouse           | 20: MP1                                |
| 5: Slope on the west side of Unit 3-4   | 13: In front of the Main Anti-earthquake Building | 21: Opening of Unit 4 Reactor Building |
| 6: Wild Bird Forest                     | 14: Water Treatment Building                      | 22: Opening of Unit 3 Reactor Building |
| 7: Mountain side of Unit 3              | 15: Solid material storage                        | 23: Opening of Unit 2 Reactor Building |
| 8: Slope on the west side of Unit 1-2   | 16: Array in front of the incinerator entrance    | 24: Opening of Unit 1 Reactor Building |





## Radioactivity Density Measurement Results of the Air in Units 1-4 and the Central Environmental Facility Building (June-August, 2012)

Unit	Sampling location	Month in which sampling was started	June 2012			July 2012			August 2012		
			I-131	Cs134	Cs137	I-131	Cs134	Cs137	I-131	Cs134	Cs137
Unit 1	Inlet of the exhaust filter system equipped on the Reactor Building	June 2012	ND	1.8E-05	2.8E-05	ND	1.2E-05	1.8E-05	ND	ND	1.4E-05
	Outlet of the exhaust filter system equipped on the Reactor Building	June 2012	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Outlet of the PCV exhaust filter	December 2011	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Large carry-in entrance of the Turbine Building	January 2012	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Waste Treatment Building (Opening on the west side)	January 2012	ND	2.3E-05	3.9E-05	ND	ND	ND	ND	1.0E-05	1.5E-05
Unit 2	Reactor Building blow-out panel	August 2011	ND	2.1E-05	3.0E-05	ND	1.0E-05	1.3E-05	ND	4.6E-06	6.3E-06
	Outlet of the PCV exhaust filter	December 2011	ND	1.8E-06	9.8E-06	ND	ND	ND	ND	ND	ND
	Large carry-in entrance of the Turbine Building	January 2012	ND	ND	9.4E-06	ND	ND	ND	ND	ND	ND
	Waste Treatment Building (Opening on the west side)	January 2012	ND	ND	ND	ND	ND	ND	ND	ND	ND
Unit 3	Upper part of the Reactor Building (Northeast)	November 2011	ND	3.2E-05	4.4E-05	ND	2.7E-05	4.0E-05	ND	8.0E-05	1.2E-04
	Upper part of the Reactor Building (Equipment hatch)	October 2011	ND	1.5E-05	1.7E-05	ND	ND	5.2E-05	ND	ND	ND
	Outlet of the PCV exhaust filter	February 2012	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Large carry-in entrance of the Turbine Building	January 2012	ND	ND	ND	ND	ND	ND	ND	8.2E-06	8.3E-06
	Waste Treatment Building (Opening on the west side)	May 2012	ND	ND	ND	ND	ND	ND	ND	ND	ND
Unit 4	Large carry-in entrance of the Reactor Building	January 2012	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Large carry-in entrance of the Turbine Building	January 2012	ND	ND	ND	ND	ND	ND	ND	ND	8.4E-06
	Waste Treatment Building (Opening on the northwest side)	January 2012	ND	ND	ND	ND	ND	ND	ND	ND	8.5E-06
Central Environment Facility	Process Main Building (Opening on the east side)	January 2012	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Incineration Workshop Building	January 2012	ND	ND	ND	ND	ND	ND	ND	ND	9.5E-06
	On-site Bunker Building (Large carry-in entrance)	January 2012	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Miscellaneous Solid Waste Volume Reduction Treatment Building	January 2012	ND	ND	ND	ND	ND	ND	ND	ND	8.3E-06
	Process Main Building (Decontamination Equipment Room)	January 2012	ND	1.1E-05	1.6E-05	ND	4.5E-05	6.0E-05	ND	ND	1.1E-05

\* The detection limits are within the range of  $10^{-5}$  to  $10^{-6}$ .

\* The I-131 measurement results have been below the detection limit since sampling was started at the locations specified above.

\* As for the inlet and outlet of the exhaust filter system equipped on the Reactor Building cover, sampling at the particulate filter was started in October 2011 and sampling at the charcoal filter was started in June 2012.