Situation of Storage and Treatment of Accumulated Water including Highly Concentrated Radioactive Materials at Fukushima Daiichi Nuclear Power Station (334th Release)

December 25, 2017 Tokyo Electric Power Company Holdings, Inc.

1. Introduction

This document is to report the following matters in accordance with the instruction of "Installment of treatment facility and storing facility of water including highly concentrated radioactive materials at Fukushima Daiichi Nuclear Power Station of the Tokyo Electric Power Company (Instruction) "(NISA No. 6, June 8, 2011), dated on June 9, 2011.

<Instruction>

TEPCO should report to NISA the situation of storing and treatment of the contaminated water in the Power Station and the future forecast based upon the current situation has to be reported to NISA as soon as the treatment facility starts its operation. Also, subsequently, continued report has to be submitted to NISA once a week until the treatment of the accumulated water in the Central Radioactive Waste Treatment Facility is completed.

2. Situation of storing and treatment of accumulated water in the building (actual record)

Stored amounts in each unit building (Units 1 to 4 (including condensers and trenches)) and stored and treated amounts, and other related data in the Accumulated Water Storing Facility as of December 21, 2017 are shown in the Attachment -1.

3. Forecast of storing and treatment

(1) Short term forecast

Water transfer is planned so that the levels of the accumulated water in Units 1 and 2 and Units 3 and 4 building will be maintained around at the level of TP. 1,564, based on the stored amount in the Accumulated Water Storing Facilities and the operating situation of the radioactive material treatment equipment. Water is transferred to the Process Main Building and/or High Temperature Incinerator Building as Accumulated Water Storing Facilities.

Treatment is implemented considering the state of storage and transfer of Accumulated Water Storing Facilities.

We assume stored amounts in each unit building (Units 1 to 4 (including condenser and trench)), and stored and treated amounts, and other related data in the Accumulated Water Storing Facilities as of December 28, 2017, as shown in Attachment -2.

(2) Middle term forecast

Regarding accumulated water in Units 1 and 2 buildings and Units 3 and 4 buildings, from the viewpoint of reducing the risks of discharging to the ocean and leaking into the groundwater, it is necessary to keep enough capacity for the accumulated water in the building until its level reaches TP. 2,564 and to keep the accumulated water level lower than the groundwater level. On the other hand, based on the view of limiting inflow of underwater to buildings and reducing the amount of emerged accumulated water, we are planning to transfer accumulated water keeping its level in the building around TP. 1,564 considering water tank capacity.

As for accumulated water of the Process Main Building and the High Temperature Incinerator Building, we are planning to treat the accumulated water considering the situation of construction of middle and low level waste water tanks, the operation factor of the radioactive material treatment instruments and duration for maintenance.

We forecast stored amounts in each unit building (Units 1 to 4 (including condensers and trenches)), and storing and treatment situations in the Accumulated Water Storing Facilities for the next 3 months, as shown in Attachment -3.

Stored amounts in each building and the water storage equipment are forecasted to be unchanged in case transfer and treatment were implemented as scheduled without rain. However, it would be subject to change depending on the operation factor of the radioactive material treatment instruments and so on.

Also, the water treated at the radioactive material treatment equipment (fresh water and condensed salt water) can be stored in the middle and low level waste water tanks.

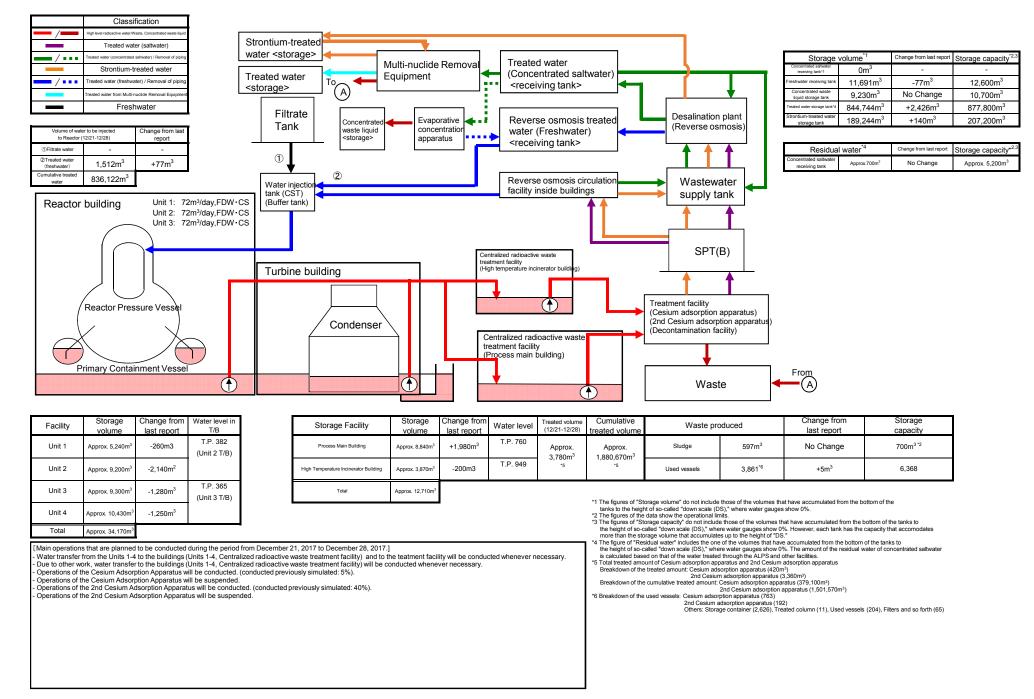
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Storage and treatment of high level radioactive accumulated water (as of December 21, 2017)

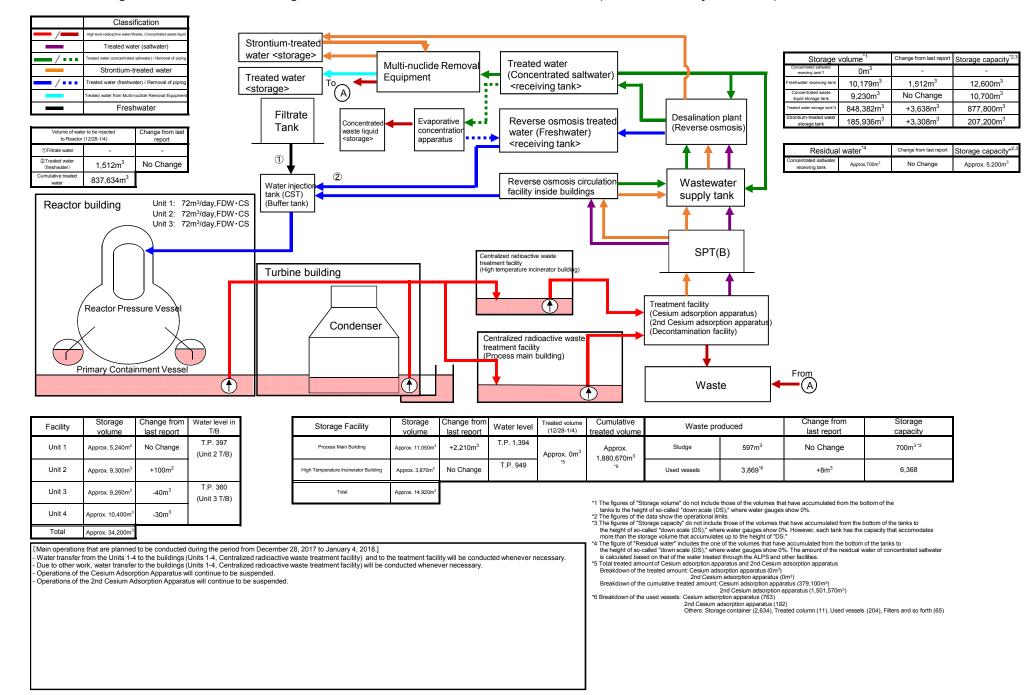
Classification												
High level radioactive water/ Waste, Concentrated waste liquid									Storage volu	ime ^{*1,2}	Change from last report	t Storage capacity*3,4
Treated water (saltwater)	Strontium-treated								concentrated saltwater receiving tank*1	0m ³	-	-
Treated water (concentrated saltwater), pipe removal	water <storage></storage>									11,768m ³	+5m ³	12,600m ³
Strontium-treated water		Multi-nuclide	Removal	Treated		(at a m)			liquid storage tank	9,230m ³	No Change	10,700m ³
Treated water (freshwater), pipe removal		Equipment			ntrated saltw /ing tank>	valer)				342,318m ³	+1,203m ³	864,300m ³
Treated water from Multi-nuclide Removal Facility	<storage></storage>			< receiv				↓ Ⅰ	Strontium-treated water storage tank 1	89,104m ³	+4,453m ³	207,200m ³
Freshwater							<mark>_</mark>					
· · · · · · · · · · · · · · · · · · ·	Filtrate	Evapor	rativo	Boyora	e osmosis tr	eated	Desalination	olant	Residual wa	ater ^{*5}	Change from last report	Storage capacity*3,4
Volume of water to be injected Change from last to Reactor (12/14-12/21) report	Tank Concentrated waste liquid	concen			Freshwater)		(Reverse osm		Concentrated saltwater tank Ap	prox. 700m ³	No Change	Approx.5,200m ³
①Filtrate water	<storage></storage>	appara	itus	· ·	ring tank>							
(2)Treated water (freshwater) 1,435m ³ -19m ³				100011	ing tarité		♠ _ ♠	↑	Storage vol	lume	Change from last report	Storage volume*3
Cumulative treated	1								Wastewater	682m ³	-92m ³	1.200m ³
water 834,610m ³				Reverse	e osmosis		Mastawa	tor	supply tank		-	
	Water injection tank (CST)				ion facility insi	ide	Wastewa		SPT(B)	991m ³	-756m ³	3,100m ³
Reactor building Unit 1: 68m ³ /day,FDW•C							supply tai	пк				
Unit 2: 70m ³ /day,FDW·C	s L				1	ГТ						
Unit 3: 67m ³ /day,FDW · C	s											concentration
									Before/After Desa			ampled on December 5)
					'		SPT(E	3	Before/After Reverse Osm		280ppm/2ppm (Sa	ampled on August 17)
			Cent	ralized radioactive ment facility	e waste			''	Before/After Evaporative	Concentration		-
	Turbine building		(High	n temperature inci	inerator building)							10
				1			T I	↑	Place of San	· •	,	concentration ^{*6}
				↓					Process Main	0		mpled on December 5)
Reactor Pressure Vessel							Treatment facility		Exit of cesium adsorpti		7.6E+02 Bq/L (San	npled on September 4)
							 (Cesium adsorption a (2nd Cesium adsorpti) 		Exit of decontamin	,		-
	/ Condenser		L				(Decontamination fac		High Temperature Incin	nerator Building		Sampled on March 7)
	(entralized radi					Exit of second cesium adso	orption apparatus	4.2E+02 Bq/L (Sar	mpled on December 5)
				iste treatment rocess main l								
Primary Containment Vessel				iste treatmen rocess main l			↓					
Primary Containment Vessel							↓ □		From			
Primary Containment Vessel		•			building)		Waste		From			
							Waste		\sim			
•			(P)	rocess main l	building)		Waste		► A		Sterror	
Facility Storage Change from Water level in	Storage facility	Storage	Change from		building)	Cumulative	Waste		Change from		Storage]
Facility Storage Change from Water level in last report T/B *8		Storage	Change from last report	Water level	Treated volume (12/14-12/21)	Cumulative treated volume	Waste proc	duced	Change from last report		capacity]
Facility Storage Change from Water level in Identified ast report T/B **	Storage facility Process Main Building	Storage	Change from	Water level	Treated volume (12/14-12/21) Approx.	Cumulative treated volume Approx.			Change from		-]
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Facility Storage volume Change from last report Water level in I/B *8 Unit 1 Approx 5,500m3 -270m3 *10 -		Storage	Change from last report	Water level * ⁸ T.P. 215	Treated volume (12/14-12/21) Approx.	Cumulative treated volume Approx.	Waste proc	duced	Change from last report		capacity	
Facility Storage volume Change from last report Water level in T/B * ⁸ Unit 1 Approx. 5,500m ³ -270m ³⁺¹⁰ Unit 2 Approx. 11,340m ³ +30m ³ T.P.701	Process Main Building High Temperature Incinerator Building	Storage volume Approx. 6,860m ³ Approx. 4,070m ³	Change from last report -3,120m3	Water level * ⁸ T.P. 215	Treated volume (12/14-12/21) Approx.	Cumulative treated volume Approx. 1,876,890m ³ -7	Waste proc Sludge Used vessels	duced 597m ³ 3,856 ^{*9}	Change from last report No Change +7		capacity 700m ^{3 *3}	
Facility Storage volume Change from last report Water level in T/B * ⁸ Unit 1 Approx 5,500m ³ -270m ^{3 10} — Unit 2 Approx 11,340m ³ +30m ³ T.P.701 Unit 3 Approx 10,580m ³ -420m3 T.P. 510	Process Main Building	Storage volume Approx. 6,860m ³	Change from last report -3,120m3	Water level * ⁸ T.P. 215	Treated volume (12/14-12/21) Approx.	Cumulative treated volume Approx. 1,876,890m ³ -7	Waste proc Sludge Used vessels	duced 597m ³ 3,856 ^{*9}	Change from last report No Change +7	e not stable. Juliated from the bot	capacity 700m ^{3 *3} 6,368	
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Attachment-1

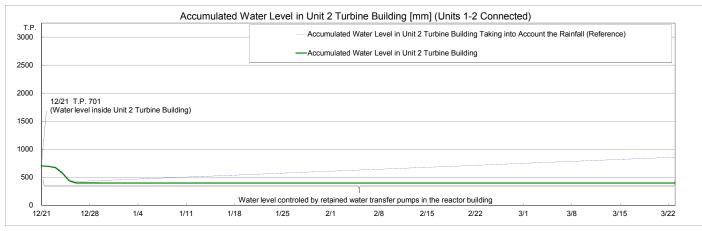
Storage and treatment of high level radioactive accumulated water (as of December 28, 2017)

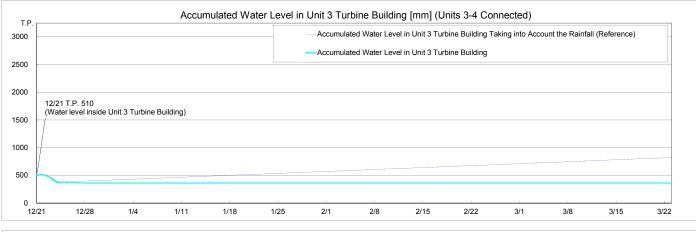


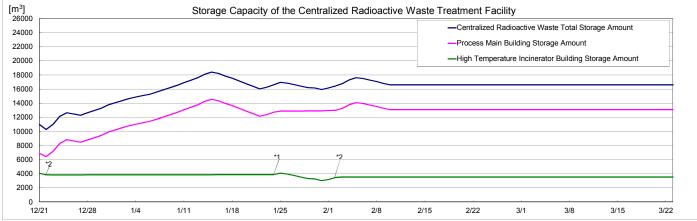
Storage and treatment of high level radioactive accumulated water (as of January 4, 2018)

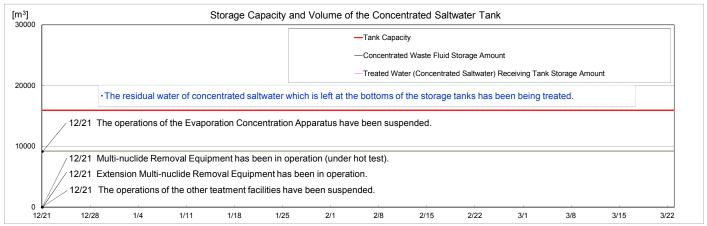


Simulation Results of Accumulated Water Treatment in Units 1-4 Turbine









Note

The amount of water treated through the 2nd Cesium Adsorption Apparatus is estimated to be 780m³/d (Subject to change depending on the factors such as the levels of water accumulated in T/Bs.) "Accumulated Water Levels in Unit 2 and 3 T/Bs" are simulated water levels in consideration of the change of the water levels caused by recent rainfall, inflow of groundwater, etc. in the surrounding areas of the Fukushima Daiichi Nuclear Power Station.

- "Accumulated Water Levels in Unit 2 and 3 T/Bs Taking into Account the Rainfall" are simulated water levels which are calculated by adding to the accumulated water amounts which are assumed to increase at the 5mm a day when the surrounding areas of the Fukushima Daiichi Nuclear Power Station have the rainfall equal to the average amount of rain which fell for three months from August to October in 2008 to 2010. "1 Water transfer from the Unit1-4 to the Centralized radioactive waste treatment facility will be changeover from the Process main building to the High temperature incinerator building. "2 Water transfer from the Unit1-4 to the Centralized radioactive waste treatment facility will be changeover from the High temperature incinerator building to the Process main building.