Status of countermeasures for restoring from the accident at Fukushima Daiich Unit 1 through 4. As of June 9th, 2011. (Estimated by JAIF)

			Unit 1	Unit 2	Unit 3	Unit 4	Notes
Basic information		Type of plant	BWR-3	BWR-4	BWR-4	BWR-4	
		Electric / Thermal power output	460/1380	784/2381	784/2381	784/2381	
Plant status when hit by the earthquake		Operation status	In service -> Shutdown	In service -> Shutdown	In service -> Shutdown	Outage	
		No. of nuclear fuels loaded in the reactor	400	548	548	0	
		No. of spent fuels stored in the SFP	292	587	514	1331	
		External power supply	Stopped due to the earthquake				
		Emergency power supply	EDGs automatically started up when the external power was lost but stopped later when tsunami hit the plants.				
Current status of the plant and the progress of countermeasures taken	Reactor cooling	Status: Core and fuel integrity	Damaged (core melt*1)	Damaged (core melt*1)	Damaged (core melt*1)	No fuels loaded	
		Status: RPV structural integrity	Limited damage and leakage	Unknown	Unknown	No damage	
		Status: PCV structural integrity	Damage and leakage suspected	Damage and leakage suspected	Damage and leakage suspected	No damage	
		Status: Core cooling	Not functional	Not functional	Not functional	Not required	
		measures: Goal of STEP 1 (April through June)	Stable cooling (circulating injection cooling reusing accumulated water)			—	
		measures: Cooling by minimum injection rate	Injecting freshwater into the reactor via feed water line at 5m3/h	Injecting freshwater into the reactor via feed water line at 5m3/h	Injecting freshwater into the reactor via feed water line at 11.5m3/h	—	Total injection flow: 21.5m3／h [6/5]
		measures: Establishment of circulating injection cooling	Work for injection line in progress	Work for injection line in progress [4/9-]	Work for injection line in progress [4/16-]	—	
		measures: Nitrogen gas injection into PCV	Injection continued [4/6-]	Work for injection line in progress [4/16-]	Work for injection line in progress [4/16-]	—	
		measures: Flooding of PCV after sealing leaks	Studying	Studying	Studying	—	
		measures: Securing heat exchange function	Work for secondary-loop piping in progress (5/13-)	Construction work to be started after improving the work environment	Construction work to be started after improving the work environment	—	
		Challenge: Improving work environment	High radiation circumstance is hampering the work to restore reactor cooling. Preparation work such as removing radioactive debris, radiation monitoring is underway in each unit. TEPCO announced its plan to recirculate and filter the air in the Unit2 R/B to reduce its radioactivity and then open the door to decrease the humidity in the building, which also hampers the work at Unit 2 [6/8].			—	
	SFP cooling	Status: Fuel integrity in SFP	Unknown	Unknown	Unknown	No severe damage suspected*2	
		Status: SFP cooling	Not functional	Not functional	Not functional	Not functional	
		measures: Goal of STEP 1 (April through June)	Stable cooling				
		measures: Reliability improvement in injection operation	Injecting freshwater via SFP coolant clean up line	Switching from freshwater injection via SFP coolant clean up line to circulation cooling	Injecting freshwater via SFP coolant clean up line	Spraying freshwater by pump truck Starting work for injection via SFP coolant cooling line	Injecting/Spraying corrosion inhibitor, hydrazine (H2NNH2), with freshwater [5/9-]
		measures: Circulation cooling with Hx	Planned	In operation	Planned	Planned	
	Accumulated water	Status: Increase and accumulation of radioactively contaminated water	High level radioactive wastewater is accumulating in the R/B, T/B and RW/B of each unit. (about 92,000m3 [5/31])				
		measures: Goal of STEP 1 (April through June)	Securing storage place of high level radioactive wastewater				
		measures: Securing storage place	-Waterproof check of Centralized Radiation Waste Treatment Facility, PMB (storage capacity: approx. 10,000m3) and MWRTB(storage capacity: approx. 4,800m3) completed -Underground tank for high level radioactive wastewater (storage capacity: approx. 10,000m3) to be installed in the mid August -Storage tanks to receive processed, low to middle level radioactive wastewater with the capacity of approx. 13,000m3 installed (-5/31). Additional capacity to be installed at 20,000m3/month from the end of June.				PMB: Process Main Building MWRTB: Miscellaneous Solid Waste Volume Reduction Treatment Building
		measures: Transfer of radioactive waste water	-Unit 2: Concrete tunnel => PMB (4/19-5/26, approx. 9,600m3, Transfer suspended and then resumed after revising the storage limit level of the building [6/4-]) -Unit 3: T/B => MWRTB (5/17-5/25、approx. 3,700m3, Transfer suspended due to possible leakage), T/B => Unit 3 main steam condenser [6/5-]				
		measures: Installation of water process facility	-Work for installing the water processing facility in progress. Water processing to be started on June 15th (capacity：1,200m3/day) -Desalination of processed radioactive water to be installed (capacity：480m3/day in the late June, then increased step by step) to reuse the water for reactor injection.				
		measures: Preventing contamination of the sea, etc.	-Silt fences installed. -Working on installation of seawater circulatory purification system [5/30-] -Blocking the concrete tunnels outside the T/Bs				
		Challenge: Preventing overflow of high level radioactive waste water	The risk of leakage of the high level radioactive wastewater accumulating in the Unit 2 and 3 T/Bs and concrete tunnels is increasing as the water level in the receiving facility was getting close to its storage limit. It has been decided to use Unit 2 and 3 main steam condensers as a receiving tank while revising the storage limit of the PMB (total increased capacity: approx. 4,300m3). Further revision of the storage limit of the facility (additional capacity: approx. 2,700m3) is under consideration.				
		measures: Goal of STEP 1 (April through June)	Storing and processing low level radio active wastewater				
		measures: Increasing storage capacity	2,200tons of tanks installed. Approx. 16,000tons of tanks to be installed by the beginning of June. 12,000 tons of receiving capacity to be secured by the end of June.				
	Undergro-und water	Status: Radioactive materials in the ground water	Radioactive iodine, I-131, and cesium, Cs-134, 137, were detected from the subdrain, underground water collected and controlled in the facility, and the well water in the Fukushima Daiichi site. [4/7-]				
		measures: Goal of STEP 1 (April through June)	Preventing contaminated underground water from spreading to the sea				
		measures: Mitigation of groundwater contamination	Restoring subdrain pumps [the middle of June]. Planning subdrain management according to the enhanced storing and processing plan.				
	Radioactive materials in the atmosphere / soil	Status: Scattering of radioactive materials to the outside of the facilities	Radioactive materials and radioactively contaminated debris scattered due to the hydrogen explosion at Unit 1 and 3 R/Bs and other events.				Survey map on the site: http://www.tepco.co.jp/en/nu/fukushima-np/f1/index3-e.html
		Status: R/B integrity	Severely damaged	Partly opened	Severely damaged	Severely damaged	
		measures: Goal of STEP 1 (April through June)	Preventing scattering of radioactive materials in the facilities and the site				
		measures: Dispersion of inhibitor	Dispersion to the outside of buildings in progress [full operation from 4/26-] Dispersion to the R/Bs and T/Bs [5/27-]				
		measures: Removal of debris	Removal of debris using remote-controlled heavy machine in progress [4/10-]				
		measures: Installing R/B cover	Under construction [5/13-]	—	Designing	Planning	
	Tsunami, reinforcement, etc.	measures: Goal of STEP 1 (April through June)	Enhancement of countermeasures against aftershocks, etc.				
		measures: Countermeasures against tsunami	-Transferring emergency power sources to the upland [4/15] -Addition of redundant water injection line [-4/15] -Setting fire trucks etc. to the upland [-4/18] -Planning to install a temporary tide barriers [by the end of June]				
		measures: Planning and implementation of reinforcement work of each unit	-Carry-in and setup of the supporting structure under the bottom of the Unit 4 SFP started. [6/7] -Soundness of structure analysis and evaluation for each unit in progress. Seismic safety confirmed for Unit 1 and 4 [5/28]				
		measures: Various radiation shielding	Pipe work completed, pumping vehicle set [5/17]				
Plant parameters	Reactor	Reactor water level (mm) [6/8 05:00]	A：Below the lower end of gauge, B：-1650, Reading mostly steady	A：-1500、B：-2100 Reading mostly steady	A：-1850、B：-2200 Reading mostly steady	—	■"A", "B" shows the group of the redundant instruments ■Reactor water level shows the length of the fuel not covered with water ■Trend data of primary parameters are available at Japan Nuclear Technology Institute's Home Page; "http://www.gengikyo.jp/english/shokai/special_4.html". **Continuously monitoring the status
		Reactor pressure (MPa) [6/8 05:00]	A：0.028, B：-, Measured with temporary pressure indicator [6/4-]	A：-0.016、B：-0.011 Reading mostly steady**	A：-0.138、B：-0.113 Reading mostly steady**	—	
		RPV temperature at feedwater nozzle (℃) [6/8 05:00]	116.2 Reading mostly steady**	109.0 Reading mostly steady	148.9 Increasing**	—	
		RPV temperature at the bottom of the vessel (℃) [6/8 05:00]	99.5 Reading mostly steady	107.7 Instrument failure	181.2 Increasing	—	
	PCV	Pressure of drywell (MPa) [6/8 05:00]	0.1328 Reading mostly steady	0.020 Decreasing	0.0996 Reading mostly steady	—	
		Pressure of suppression pool (MPa) [6/8 05:00]	0.115 Reading mostly steady	Below the lower end of gauge Instrument failure	0.1803 Reading mostly steady	—	
	Pool	Water temperature of SFP	Instrument failure	32℃ [6/8 05:00]	62℃ (5/8)	84℃ (5/7)	
	Accumulated water	R/B basement: Volume*3	3,900m3[5/31]	6,000m3[5/31]	6,400m3[5/31]	6,500m3[5/31]	
		R/B basement: Radioactivity*3	4.0E+5Bq/cm3	1.9E+7Bq/cm3	3.8E+5Bq/cm3	2.0E+5Bq/cm3	
		T/B basement: Volume*3	8,400m3[5/31]	11,400m3[5/31]	13,600m3[5/31]	11,800m3[5/31]	
		T/B basement: Radioactivity*3 (Dose at water surface)	4.0E+5Bq/cm3 (60mSv/h[4/28])	1.9E+7Bq/cm3 (1,000mSv/h以上[3/28])	3.8E+5Bq/cm3 (120～750mSv/h[3/24,4/22])	2.0E+5Bq/cm3 (4.5mSv/h[4/21])	
		RW/B basement: Volume*3	1,100m3[5/31]	2,400m3[5/31]	2,300m3[5/31]	3,700m3[5/31]	
		RW/B basement: Radioactivity*3	4.0E+5Bq/cm3	1.9E+7Bq/cm3	3.8E+5Bq/cm3	2.0E+5Bq/cm3	
		Concrete tunnel outside of T/B: Volume*3	2,800m3[5/31]	4,800m3[5/31]	5,800m3[5/31]	900m3[5/31]	
		Concrete tunnel outside of T/B: Radioactivity*3 (Dose at water surface)	6.9Bq/cm3 (0.4mSv/h[3/27])	1.1E+7Bq/cm3 (>1,000mSv/h [3/27])	2.4E+5Bq/cm3	2.0E+5Bq/cm3	
		Total volume	91,800m3 (Approx. 105,000m3 including the wastewater transferred to the Centralized Radiation Waste Treatment Facility)				
Environmental effect in the vicinity of the station			-Air dose rate: 5～121μSv/h at the NPS border (Monitoring Post), 363μSv/h at the south side of the office building, 14μSv/h at the wet gate [6/9 09:00] -Some radioactive materials (I, Cs, Pu, Am Cm and Sr) has been detected in the soil sampled at the site. Radioactive materials have been detected in samples corrected from underground water and also seawater at or near the site. Environmental monitoring has been enhanced [4/16-]。				Air dose rate：http://www.tepco.co.jp/en/nu/fukushima-np/f1/index-e.html Air, seawater, underground water soil, etc.: http://www.tepco.co.jp/en/nu/fukushima-np/f1/index2-e.html
Radiation exposure of the workers			30 workers has been exposed to radiation more than 100 mSv as of 5/30. It was found that two plant operators had taken in high level of radioactive iodine into the body. Evaluation made by a research institute shows that their exposure dose is somewhere between 200mSv and 580mSv. [announced by TEPCO on 6/3] *Emergency exposure dose limit has been set to 250mSv				

*1 TEPCO's analysis [announced on 5/15,23]
*2 TEPCO estimated that there was no severe damage to the fuel in the Unit 4 SFP based on the concentration of radioactive materials in the pool and the pictures of the pool. [4/13,28,29]
*3 Rough estimate by TEPCO [announced on 5/31]

[Source]
Government Nuclear Emergency Response Headquarters: News Release, Press conference
NISA: News Release, Press conference
TEPCO: Press Release, Press Conference

[Significance judged by JAIF]
:Low
:High
:Severe (Need immediate action)

[Progress of countermeasures]
: Completed
: Under construction
: To be done (including studying and manufacturing)

[Abbreviations]
SFP: Spent Fuel Storage Pool
EDG: Emergency Diesel Generator
RPV: Reactor Pressure Vessel
PCV: Primary Containment Vessel
R/B: Reactor Building
T/B: Turbine Building
RW/B: Radioactive Waste Disposal Building
RHR: Residual Heat Removal system
CST: Condensate water Storage Tank
Hx: Heat exchanger
NPS: Nuclear power station