Status of countermeasures for restoring from the accident at Fukushima Daiich Unit 1 through 4. As of June 24th, 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 3.5m3/h	Injecting freshwater into the reactor via feed water line at 3.5m3/h	Injecting freshwater into the reactor via feed water line at 9.4-9.5m3/h	—	Decreasing the injection rate to prevent the overflow of the accumulated water in the facilities
		measures: Establishment of circulating injection cooling	Injection line established (Circulation to be started following the radioactive water process facility starts its operation)			—	
		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. The doors of the Unit 2 R/B, where high humidity has hampered the work inside, was opened for ventilation [6/19-] after filtering and removing the airborne radioactive materials in the building. After confirming improved work environment, work was started in the building [6/22-].			—	
	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	Injecting freshwater via alternative injection line, Preparing system for cooling in a stable manner	Injecting corrosion inhibitor, hydrazine (H2NNH2), with freshwater [5/9-]
		measures: Circulation cooling with Hx	Planned	In operation	Planned (Construction to be started in late June)	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	-Storage capacity of 14800m3 (10,000m3 + 4,800m3) for highly radioactive wastewater are secured by using the Centralized Radiation Waste Treatment Facility as water storage place. -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	Highly radioactive wastewater in Unit 2 and unit 3 has being translated the Centralized Radiation Waste Treatment Facility since April 19.				
		measures: Installation of water process facility	-Highly radioactive wastewater treatment system for recycling water started operation on June 17, and stopped for trouble about 5 hours later. Test operation in progress [6/21-]. (processing capacity: 1,200m3/day) Processed water through the system is to be reused for reactor cooling after desalination. (Initial capacity: 480m3/day, to be installed in the late June)				
		measures: Preventing contamination of the sea, etc.	-Silt fences installed. -Seawater circulatory purification system goes into full-scale operation. [6/13] -Blocking the concrete tunnels outside the T/Bs completed [6/10], etc.				
		Challenge: Preventing overflow of high level radioactive waste water	Highly radioactive wastewater treatment system should be operated in stable and effective manner to prevent wastewater accumulated in unit-2 and 3 overflowing.				
		measures: Goal of STEP 1 (April through June)	Storing and processing low level radio active wastewater				
		measures: Increasing storage capacity	18,400 tons(2,200 + 6,200 + 10,000) of tanks installed. 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, cesium, Cs-134, 137, and Sr-89, 90 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	Pumps for correcting underground water called "subdrain" is to be restored in the middle of June. Subdrain is to be treated in accordance with the contaminated water management plan. Construction of wall for underground water isolation is under consideration.				
	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	Preparation work in progress [5/13-] Installation work of the cover to be started on 6/27	—	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	-Work for installing supporting structure under the bottom of the Unit 4 SFP in progress. Steel pillars installed [6/7-6/20]. Work to be completed by filling concrete and grout by the end of July. -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) [6/23 11:00]	A: Below the lower end of gauge, B: -1600**, Reading mostly steady	A: being calibrated, B: -2150 Reading mostly steady**	A: -1850, B: -2100 Reading mostly steady**	—	■"A", "B" shows the group of the redundant instruments ■Reactor water level monitors to be calibrated. Unit 1 Ch.A done.[5/11] Unit 2 Ch.A now being caribrated.[6/22-] ■Reactor water level shows the length of the fuel not covered with water ■Primary parameters' trend is available at JANTI's HP; http://www.gengikyo.jp/english/shokai/special_4.html. **Continuously monitoring the status
		Reactor pressure (MPa) [6/23 11:00]	A: 0.033, B: -, Measured with temporary pressure indicator [6/4-]	A: -0.018, B: -0.005 Reading mostly steady**	A: -0.151, B: -0.100 Reading mostly steady**	—	
		RPV temperature at feedwater nozzle (℃)[6/23 11:00]	118.2 Reading mostly steady	107.9 Reading mostly steady	149.5 Slightly increased	—	
		RPV temperature at the bottom of the vessel (℃)[6/23 11:00]	102.1 Reading mostly steady	107.8 Reading mostly steady	120.5 Slightly fluctuate	—	
	PCV	Pressure of drywell (MPa) [6/23 11:00]	0.1379 Reading mostly steady	0.010 Decreasing**	0.0991 Reading mostly steady	—	
		Pressure of suppression pool (MPa) [6/23 11:00]	0.115 Reading mostly steady	Below the lower end of gauge Instrument failure	0.1832 Reading mostly steady	—	
	Pool	Water temperature of SFP	Instrument failure	33℃ [6/23 11:00]	62℃ [5/8]	87-89℃ [6/22 16:50]	
	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	4.0E+5Bq/cm3[3/26]	1.9E+7Bq/cm3[3/27]	3.8E+6Bq/cm3[4/22]	2.0E+4Bq/cm3[4/21]	
		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 (Dose at water surface)	4.0E+5Bq/cm3[3/26] (60mSv/h[4/28])	1.9E+7Bq/cm3[3/27] (1,000mSv/h以上[3/28])	3.8E+6Bq/cm3[4/22] (120～750mSv/h[3/24,4/22])	2.0E+4Bq/cm3[4/21] (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	4.0E+5Bq/cm3[3/26]	1.9E+7Bq/cm3[3/27]	3.8E+6Bq/cm3[4/22]	2.0E+4Bq/cm3[4/21]	
		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 (Dose at water surface)	6.9Bq/cm3[3/29] (0.4mSv/h[3/27])	1.1E+7Bq/cm3[3/30] (1,000mSv/h以上[3/27])	2.4E+2Bq/cm3[3/30]	2.0E+4Bq/cm3[4/21]	
		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: 5-117 μSv/h at the NPS border (Monitoring Post), 347 μSv/h at the south side of the office building, 13 μSv/h at the wet gate [6/24 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 collected from underground water and also seawater at or near the site. Environmental monitoring has been enhanced [4/16-]. Sr-89, 90 exceeding the regulatory limit have been detected from the seawater sampled on 5/16 near the seawater intake.				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			TEPCO is examining some 3,700 workers who have worked at the plant since March 11th for exposure to radiation. Of that number, 3,514 have undergone medical checkups. It revealed that 124 received radiation doses above 100 mSv. (100-200mSv: 107 workers, 200-250mSv:8 workers, 250mSv-:9 workers) Amount of doses that the 2 workers who received most are 643mSv and 678mSv.[6/20] *The allowable emergency limit for radiation doses: 250 millisieverts				

*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