Status of nuclear power plants in Fukushima as of 10:00 March 21 (Estimated by JAIF)

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Electric / Harmer Power outlook (MM)			Fukushima Dajichi Nuclear Power Station							
Proceeding State of the personal processing of the process Processing State of the personal process	Unit	1	2	3	4	5	6			
December Officers of the act how exchanged occurred December	Electric / Thermal Power output (MW)					-				
Der each Entertriary Der each protective Containment Vessel Integrity Der each protective Vessel Vesse	Type of Reactor	BWR-3	BWR-4	BWR-4	BWR-4	BWR-4	BWR-5			
Presence Presence Vessel Integrity Discount Market Services Mark the Presence Associated	Operation Status at the earthquake occurred	In Service -> Shutdown	In Service -> Shutdown	In Service -> Shutdown	Outage	Outage	Outage			
Presence Presence Vessel Integrity Discount Market Services Mark the Presence Associated	Core and Fuel Integrity	Damaged	Damaged	Damaged	No fuel rods	Not Damaged	Not Damaged			
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Remarks Rem	Fuel Integrity in the spent fuel pool		Seawater Injection continue	Seawater spray continue and	Seawater spray continue	recovered	was recovered			
Immediate threat is damage of the fuels in the fuel pool outside the containment vessel. The operation for spraying water to the pool is continuing at uni-3 and 4 and certain effect has been confirmed. Seawater injection to the pool was conducted at unit-2 on Mar. 20th. The pressure of the containment vessel increased at unit-3 in the morning of Mar. 20th. The pressure became stable at higher level after this increase. Winle monitoring the caresure casefully, it has been determined that pressure discharge of the vessel is not required immediately. Work to receiver ACI power for Unit-1 through 6 is in progress. External ACI power has reached to the distribution switchboard for Unit-2. Integrity check of equipment of Unit-2 is going on, which must be done before energizing them. Power Station	Environmental effect									
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Remarks	INES (actimated by NISA)	Lovel 5	l							
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Unit-1, 2, 3 & 4, which were in full operation when the earthquake occurred, all shutdown automatically. External power supply was available after the quake. While injecting water into the reactor pressure vessel using make-up water system, TEPCO recovered the core cooling function and made the unit into cold shutdown state one by one. Latest Monitor Indication: 10.5 μ Sv/h at 3.00, Mar. 21 at NPS border	Remarks Power Station Unit Electric / Thermal Power output (MW) Type of Reactor Operation Status at the earthquake occurred	Immediate threat is damage has been confirmedSeawa The pressure of the contains pressure carefully, it has been work to recover AC power for going on, which must be don	of the fuels in the fuel pool outside ter injection to the pool was condument vessel increased at unit-3 in en determined that pressure discharger Unit-1through 6 is in progress. Le before energizing them. Fukushima Daini N 2 1100 BWR-5 In Service -> Al	e the containment vessel. The octed at unit-2 on Mar. 20th. the morning of Mar. 20th. The orge of the vessel is not required External AC power has reache uclear Power Station 3 / 3293 BWR-5 utomatic Shutdown	pressure became stable at higher dimmediately. d to the distribution switchboard f	level after this increase. Wh	ile monitoring the			
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[Abbreviations]
INES: International Nuclear Event Scale
NISA: Nuclear and Industrial Safety Agency

SFP: spent fuel pool

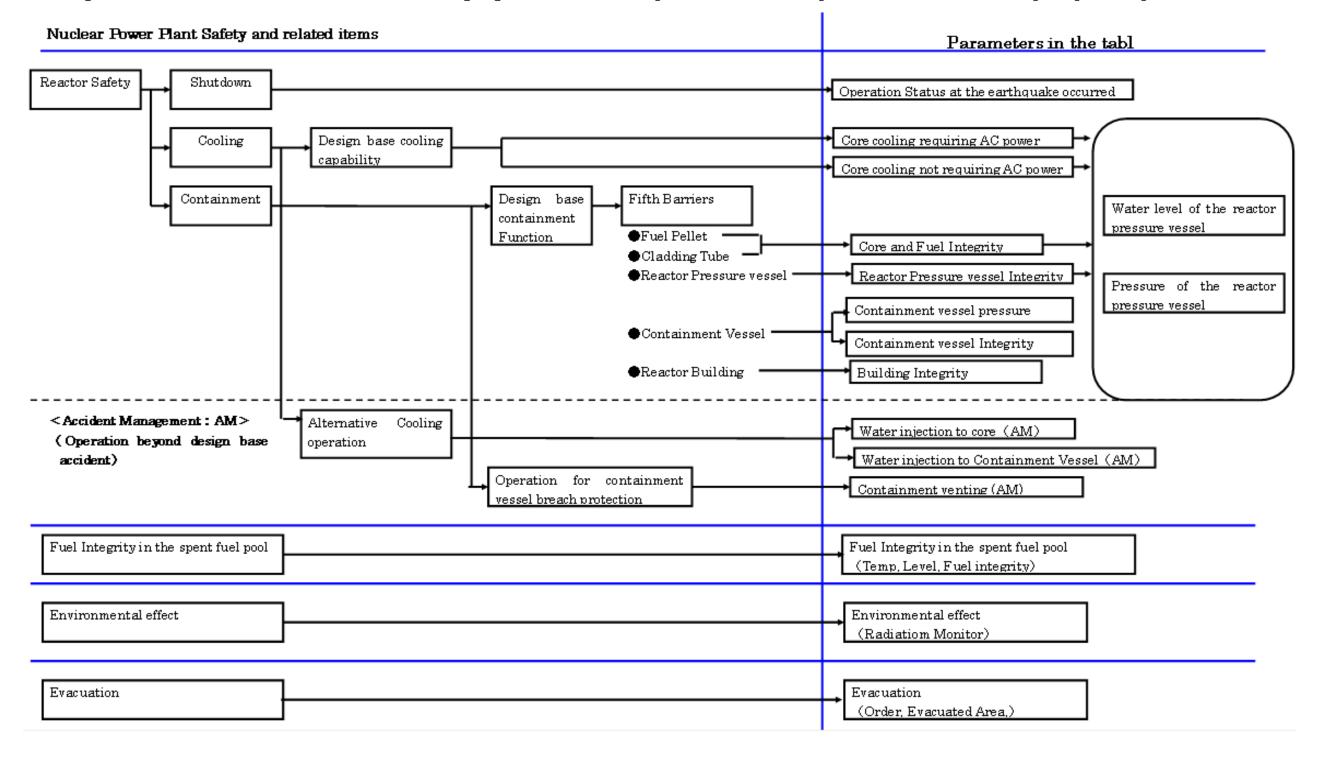
TEPCO: Tokyo Electric Power Company, Inc.



Parameters in the Table

JAIF picks up these parameters to evaluate safety condition of the nuclear plants during this accident from the view point of the principles of nuclear power plant safety, which are "Shutdown",

"Cooling" and "Containment". Then we create the chart. The following diagram is to show the correspondence relation of these parameters in the table to nuclear power plant safety.



Accidents of Fukushima Dai-ichi and Fukushima-Dai-ni Nuclear Power Stations

(March 20, 2011 22:00)

JAIF

1. Latest Major Incidents and Actions

<March 19>

05:00: AC power source provided by emergency diesel generator becomes available at unit-5 and 6. Cooling of the spend fuel pool started at unit-5.

08:10: Radiation measured at the west gate of the power station is 830.8 μSv/h.

22:14: Cooling of the spend fuel pool started at unit-6.

<March 20>

15:05 - 17:20: Seawater injection to the spent fuel pool has been conducted at unit-2

2. Chronology of Nuclear Power Stations

(1) Fukushima Dai-ichi NPS

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5, 6	
Major Incidents and Actions	11th 15:42 Report IAW Article 10*	11th 15:42 Report IAW Article 10*	11th 15:42 Report IAW Article 10*	14th 04:08 Water temperature in Spent	Water temperature in SF Storage Pool is	
Inidio Indiaents and Actions	(Loss of power)	(Loss of power)	(Loss of power)	Fuel Storage Pool increased at 84°C	increasing	
*The Act on Special Measures Concerning Nuclear Emergency Preparedness	11th 16:36 Event falling under Article	11th 16:36 Event falling under Article	13th 05:10 Event falling under Article	15th 09:38 Fire occurred on 3rd floor	18th Vent hole was opened on the rooftop	
	15* occurred (Incapability of water	15* occurred (Incapability of water	15* occurred (Loss of reactor cooling	(extinguished spontaneously)	for avoiding hydrogen explosion	
	injection by core cooling function)	injection by core cooling function)	functions)	(Oxtanguished Spontaneously)	a. c.a.iig ii, ai egen explodion	
	12th 00:49 Event falling under Article	14th 13:25 Event falling under Article	13th 08:41 Start venting	16th 05:45 Fire occurred (extinguished spontaneously)	19th 05:00 RHR-pump in the unit 5 restarted.	
	15* occurred (Abnormal rise of CV	15* occurred (Loss of reactor cooling				
	pressure)	functions)				
	12th 14:30 Start venting	14th 16:34 Seawater injection to RPV	13th 13:12 Seawater injection to RPV	Since 20th, operation of spraying water to the spent fuel pool has been conducted.	20th 14:30 Reactor cold shutdown at unit 5 20th 19:27 Reactor cold shutdown at unit 6	
	12th 15:36 Hydrogen explosion	14th 22:50 Report IAW Article 15*	14th 07:44 Event falling under Article			
		(Abnormal rise of CV pressure)	15* occurred (Abnormal rise of CV			
	12th 20:20 Seawater injection to RPV	15th 00:00 Start venting	14th 11:01 Hydrogen explosion			
		15th 06:10 Sound of explosion, Suppression Pool damaged	15th 10:22 Radiation dose 400mSv/h			
		15th 08:25 White smoke reeked	16th 06:40, 08:47 Radiation dose 400mSv/h			
		20t 15:05, operation of seawater injection to the spent fuel pool started	16th 08:34, 10:00 White smoke reeked			
			Since 17th, operation of spraying water			
			to the spent fuel pool continue			
	Work to recover external AC power is in progress.		External power supply of Unit 3 to 6 are to be connected.			
Major Data	Water level (20th 15:00)	Water level (20th 15:00)	Water level (20th <u>16:00</u>)	Water temperature of SF Storage Pool	Water temperature of SF Storage Pool (20th 16:00)	
	(A) <u>-1700</u> mm (B) -1750mm	<u>-1400</u> mm	(A) - <u>1650</u> mm, (B) <u>-2000</u> mm	Immeasurable (since 14th 04:08)	Unit 5 35.1°C Unit 6 28.0°C	
	Reactor pressure (20th 15:00) (A) 0.187MPaG, (B) 0.158MPaG	Reactor pressure (20th 15:00) (A) -0.016MPaG, (B) -0.020MPaG	Reactor pressure (20th 16:00) (A) <u>0.119</u> MPaG, (B) <u>0.162</u> MPaG			
	CV pressure (<u>20th 15:00</u>) <u>0.17</u> MPaabs	CV pressure (20 <u>th 15:00</u>) <u>0.125</u> MPaabs	CV pressure 0.340MPaabs (20th 04:30) 0.290MPaabs (20th 16:00)			

(2) Fukushima Dai-ni NPPs

All units are cold shutdown (Unit-1, 2, 4 have been recovered from a event falling under Article 15*)

3. State of Emergency Declaration

11th 19:03 State of nuclear emergency was declared (Fukushima Dai-ni NPS)

12th 07:45 State of nuclear emergency was declared (Fukushima Dai-ichi NPS)

4. Evacuation Order

11th 21:23 PM direction: for the residents within 3km radius from Fukushima I to evacuate, within 10km radius from Fukushima I to stay in-house

12th 05:44 PM direction: for the residents within 10km radius from Fukushima I to evacuate

12th 17:39 PM direction: for the residents within 10km radius from Fukushima II to evacuate

12th 18:25 PM direction: for the residents within 20km radius from Fukushima I to evacuate

15th 11:06 PM direction: for the residents within 20-30km radius from Fukushima I to stay in-house



Status of the Nuclear Power Plants after the Earthquake

