Status of nuclear power plants in Fukushima as of 10:00 March 19 (Estimated by JAIF)

Power Station	Fukushima Daiichi Nuclear Power Station					
Unit	1	2	3	4	5	6
Electric / Thermal Power output (MW)	460 / 1380	784 / 2381				1100 /3293
Type of Reactor	BWR-3	BWR-4	BWR-4	BWR-4	BWR-4	BWR-5
Operation Status at the earthquake occurred	In Service -> Shutdown	In Service -> Shutdown	In Service -> Shutdown	Outage	Outage	Outage
Core and Fuel Integrity	Damaged	Damaged	Damaged	No fuel rods	Not Damaged	Not Damaged
Reactor Pressure Vessel Integrity	Unknown	Unknown	Unknown			
Containment Vessel Integrity	Not Damaged	Damage Suspected	Might be "Not damaged"	Not Damaged	Not Damaged	Not Damaged
Core cooling requiring AC power	Not Functional	Not Functional	Not Functional	Not necessary	Not necessary	Not necessary
Core cooling not requiring AC power	Not Functional	Not Functional	Not Functional	Not necessary	Not necessary	Not necessary
Building Integrity	Severely Damaged	Slightly Damaged	Severely Damaged	Severely Damaged	Open a vent hole on the rooftop for avoiding hydrogen explosion	
Water Level of the Rector Pressure Vessel	Fuel exposed partially or fully	Fuel exposed partially or fully	Fuel exposed partially or fully	Safe	Safe	Safe
Pressure of the Reactor Pressure Vessel	Stable	Unknown	Stable	Safe	Safe	Safe
Containment Vessel Pressure	Unknown	Low	Low	Safe	Safe	Safe
Water injection to core (Accident Management)	Continuing (Seawater)	Continuing(Seawater)	Continuing(Seawater)	Not necessary	Not necessary	Not necessary
Water injection to Containment Vessel (AM)	Continuing(Seawater)	to be decided(Seawater)	Continuing(Seawater)	Not necessary	Not necessary	Not necessary
Containment venting (AM)	Temporally stopped	Temporally stopped	Temporally stopped	Not necessary	Not necessary	Not necessary
Fuel Integrity in the spent fuel pool	Water injection to be considered	(No info)	Water level low, Water Injection continue	Water level low, Preparing Water Injection Hydrogen from the pool exploded	Pool Temp. Increasing	Pool Temp. Increasing
Environmental effect	The East Gate: 304 μ Sv/h at 03:30, Mar. 19					
Evacuation	20km from NPS ＊People who live between 20km to 30km from the Fukushima #1NPS are to stay indoors.					
INES (estimated by NISA)	Level 5	Level 5	Level 5	Level 3	—	—
Remarks	Immediate threat is damage of the fuels in the fuel pool outside the containment vessel at Unit-1,2,3 and 4. The operation for filling the pool with water has been conducted since March 17 at Unit-3.Same operation scheduled to start in the afternoon. Attempting to receive external power supply, TEPCO is laying a power cable between the transmission line .External power supply of Unit-1 and 2 are scheduled to be connected until March 19. Unit 3 to 6 are scheduled to be connected until March 20.					

Power Station	Fukushima Daini Nuclear Power Station			
Unit	1	2	3	4
Electric / Thermal Power output (MW)	1100 / 3293			
Type of Reactor	BWR-5	BWR-5	BWR-5	BWR-5
Operation Status at the earthquake occurred	In Service -> Automatic Shutdown			
Status	All the units are in cold shutdown.			
INES (estimated by NISA)	Level 3	Level 3	—	Level 3
Remarks	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: 15.9 μ Sv/h at 12:00, Mar. 17 at NPS border Evacuation Area: 10km from NPS			

Power Station	Onagawa Nuclear Power Station		
Unit	1	2	3
Operation Status at the earthquake occurred	In Service -> Automatic Shutdown		
Status	All the units are in cold shutdown.		
Remarks	Unit-1, 2 & 3 all shutdown automatically when the earthquake occurred. Unit-2 & 3 were then led into cold shutdown state. Unit-2, which had just started operation after planned outage, got into cold shutdown immediately.		

Power Station	Tokai Daini
Operation Status at the earthquake occurred	In Service -> Automatic Shutdown
Status	In cold shutdown.
Remarks	Tokai Daini NPP, which was in full operation when the earthquake occurred, shutdown automatically. Core cooling function was gotten into service after external power supply was recovered on Mar. 13.

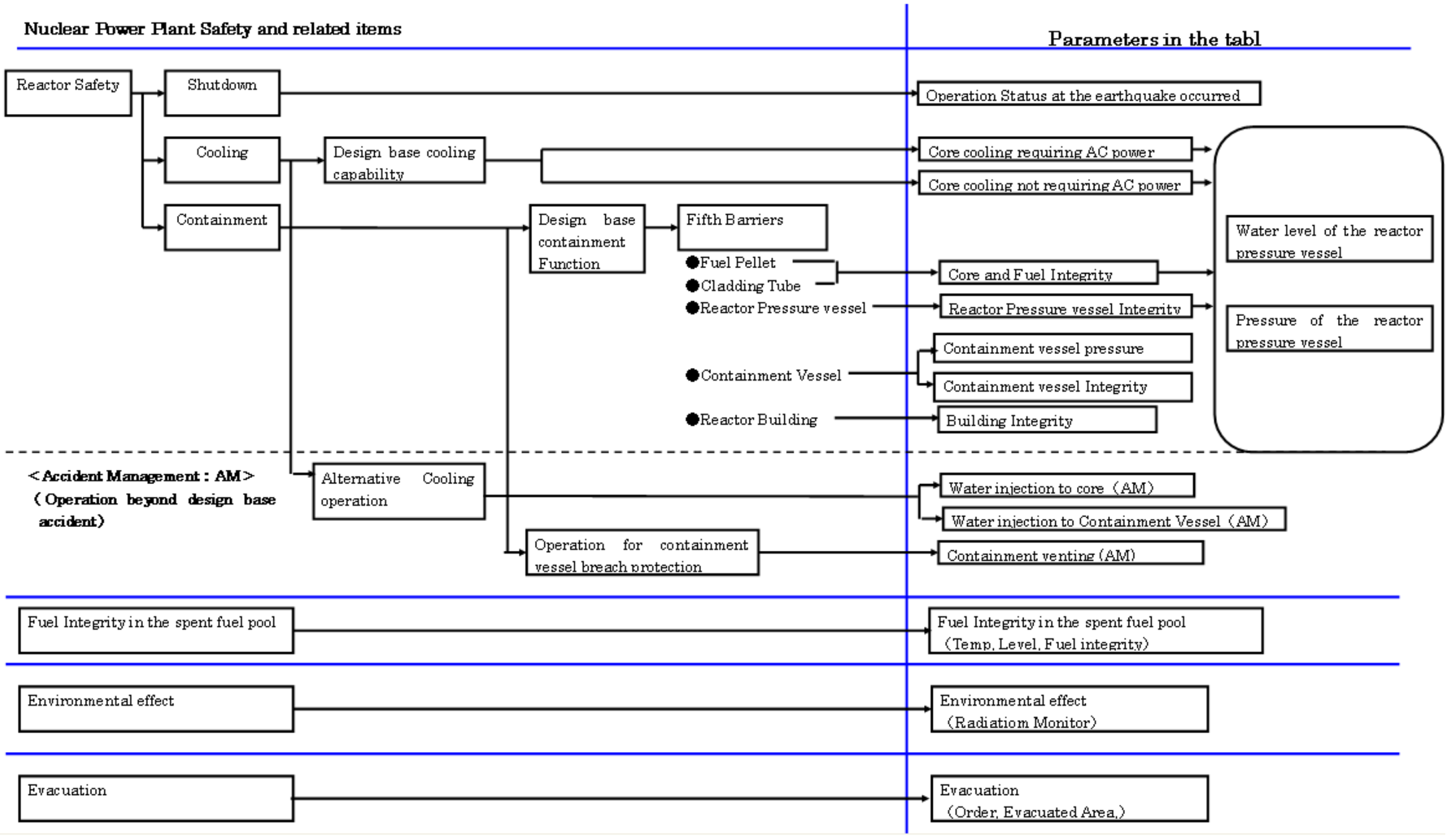
[Significance judged by JAIF]
: low
: high
: severe

[Source]
Governmental Emergency Headquarters: News Release (-3/19 04:00), Press conference
NISA: News Release (-3/18 22:00), Press conference
TEPCO: Press Release (-3/18 22:00), Press Conference

[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 19, 2011 (07:00)
by Government Nuclear Emergency Response Headquarters

1. Latest Major Incidents and Actions

<March 18>
14:00 Ground-based water discharge (7 times) by SDF (～14:38)
14:42 Ground-based water discharge (once) by TEPCO using US forces' water cannon truck (～14:45)
<March 19>
00:30 Ground-based water discharge by Tokyo Fire Department(～01:10)
Attempting to receive external power supply, TEPCO is laying a power cable between the transmission line.
Ground-based water discharge is scheduled to start in the afternoon.

2. Status of Nuclear Power Stations

(1) Fukushima Dai-ichi NPS

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5, 6
Major Incidents and Actions **The Act on Special Measures Concerning Nuclear Emergency Preparedness*	11th 15:42 Report IAW Article 10* (Loss of power)	11th 15:42 Report IAW Article 10* (Loss of power)	11th 15:42 Report IAW Article 10* (Loss of power)	14th 04:08 Water temperature in Spent Fuel Storage Pool increased at 84℃	Water temperature in SF Storage Pool is increasing
	11th 16:36 Event falling under Article 15* occured (Incapability of water injection by core cooling function)	11th 16:36 Event falling under Article 15* occurred (Incapability of water injection by core cooling function)	13th 05:10 Event falling under Article 15* occurred (Loss of reactor cooling functions)	15th 09:38 Fire occurred on 3rd floor (extinguished spontaneously)	18th Vent hole was opened on the rooftop for avoiding hydrogen explosion
	12th 00:49 Event falling under Article 15* occured (Abnormal rise of CV pressure)	14th 13:25 Event falling under Article 15* occurred (Loss of reactor cooling functions)	13th 08:41 Start venting	16th 05:45 Fire occurred (extinguished spontaneously)	19th 05:00 RHR-pump in the unit 5 restarted.
	12th 14:30 Start venting	14th 16:34 Seawater injection to RPV	13th 13:12 Seawater injection to RPV		
	12th 15:36 Hydrogen explosion	14th 22:50 Report IAW Article 15* (Abnormal rise of CV pressure)	14th 07:44 Event falling under Article 15* occurred (Abnormal rise of CV pressure)		
	12th 20:20 Seawater injection to RPV	15th 00:00 Start venting	14th 11:01 Hydrogen explosion		
		15th 06:10 Sound of explosion, Supression Pool damaged	15th 10:22 Radiation dose 400mSv/h		
		15th 08:25 White smoke reeked	16th 06:40, 08:47 Radiaton dose 400mSv/h		
			16th 08:34, 10:00 White smoke reeked		
			17th 09:48 Water discharge by SDF helicopters		
			17th 19:05 Water discharge by riot police (once)		
			17th 19:35 Water discharge by SDF (5 times)		
			18th 14:00 Water discharge by SDF		
			18th 14:42 Water discharge by TEPCO using US forces' water cannon truck (once)		
			19th 00:30 Ground-based water discharge by Tokyo Fire Department(～01:10)		
			19th P.M. Ground-based water discharge will restart		
	External power supply of Unit-1 and 2 are scheduled to be connected until March 19.		External power supply of Unit 3 to 6 are scheduled to be connected until March 20.		
Major Data	Water level (18th 21:10) (A) -1750mm (B) -1800mm	Water level (18th 21:10) -1400mm	Water level (19th 06:10) (A) -1200mm, (B) -2300mm	Water temperature of SF Storage Pool Unmesurable (since 14th 04:08)	Water temperature of SF Storage Pool (18th 22:00) Unit 5 67.6℃ Unit 6 65.0℃
	Reactor pressure (18th 21:10) (A) 0.164MPaG, (B) 0.142MPaG	Reactor pressure (18th 21:10) (A) -0.016MPaG, (B) -0.032MPaG	Reactor pressure (19th 06:10) (A) 0.005MPaG, (B) 0.045MPaG		
	CV pressure (18th 21:10) Unmesurable (14th 10:30-)	CV pressure (18th 21:10) 0.140MPaabs	CV pressure (19th 06:10) 0.045MPaabs		

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

Every efforts and measures have been taken at Fukushima Daiichi nuclear power plants. Other nuclear power plants in Japan are in normal operation or safely shutdown.