Extract



April 21, 2011 Nuclear and Industrial Safety Agency

### Seismic Damage Information (the 105th Release)

(As of 08:00 April 21st, 2011)

Nuclear and Industrial Safety Agency (NISA) confirmed the current situation of Onagawa NPS, Tohoku Electric Power Co. Inc.; Fukushima Dai-ichi and Fukushima Dai-ni NPSs, Tokyo Electric Power Co. Inc. (TEPCO); Tokai Dai-ni NPS, Japan Atomic Power Co. Inc. as follows:

Major updates are as follows.

- 1. Nuclear Power Stations (NPSs)
  - Fukushima Dai-ichi NPS
  - In order to cool the Spent Fuel Pool of Unit 4, the Fresh water spray of around 100t using Concrete Pump Truck (62m class) was carried out. (From 17:08 till 20:31 April 20th)
  - The pump for Residual Heat Removal (RHR) was temporarily stopped in order to change the position of the hose of the temporary RHR Seawater System of Unit 6. (09:51 April 20th) After carrying out the work of transferring of the pump for temporary Residual Heat Removal (RHR), cooling was resumed.
  - The test implementation of spraying anti-scattering agent to prevent the spread of radioactive materials on the ground surface was carried out in the area of about 1,900 m<sup>2</sup> around the Radioactive Waste Treatment Facilities (From 12:00 till 13:30 April 20th).
  - Removal of rubble (Amount equivalent to a container) using remote-control heavy machineries was carried out. (From 9:00 till 16:00 April 20th)

For more information:

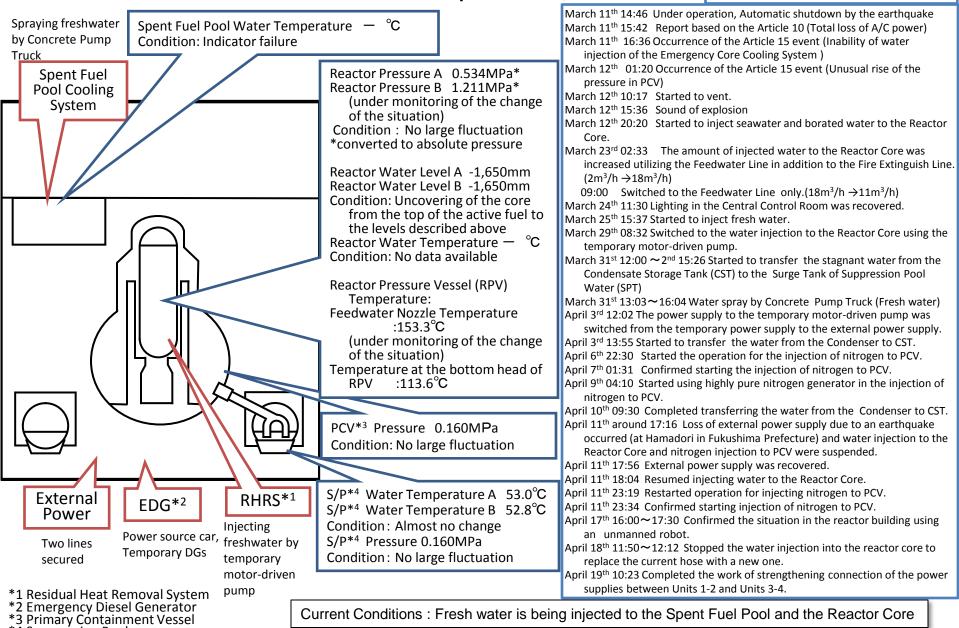
NISA English Home Page

http://www.nisa.meti.go.jp/english/index.html

## Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 1

(As of 13:00 April 21st, 2011)

Major Events after the Earthquake



\*4 Suppression Pool

### Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 2

Spraying freshwater ( As of 13:00 April 21st, 2011 ) by temporary motor-Major Events after the Earthquake 1/2 driven pump through Spent Fuel Pool Water Temperature 56.0 °C existing cooling system March 11th 14:46 Under operation, Automatic shutdown by the earthquake Spent Fuel March 11<sup>th</sup> 15:42 Report based on the Article 10 (Total loss of A/C power) Reactor Pressure A 0.078MPa\* **Pool Cooling** March 11th 16:36 Occurrence of the Article 15 event (Inability of water injection of the Emergency Core (under monitoring of the change System Cooling System ) of the situation) March 13th 11:00 Started to vent. Reactor Pressure D 0.076MPa\* March 14th 13:25 Occurrence of the Article 15 event (Loss of reactor cooling functions) (under monitoring of the change March 14th 16:34 Started to inject seawater to the Reactor Core. of the situation) March 14th 22:50 Occurrence of the Article 15 event (Unusual rise of the pressure in PCV) Condition: No large fluctuation March 15th 00:02 Started to vent. \*converted to absolute pressure March 15<sup>th</sup> 06:10 Sound of explosion Reactor Water Level A -1,500mm March 15<sup>th</sup> around 06:20 Possible damage of the suppression chamber Reactor Water Level B -2.050mm March 20<sup>th</sup> 15:05 ~17:20 Approximately 40 ton seawater injection to the Spent Fuel Pool (SFP) via the Condition: Uncovering of the core Fuel Pool Cooling Line (FPC) from the top of the active fuel to March 20th 15:46 Power Center received electricity. the levels described above March 21st 18:22 White smoke generated. The smoke died down and almost invisible at 07:11 March Reactor Water Temperature -°C March 22<sup>nd</sup> 16:07 Injection of around 18 tons of seawater to SFP Condition: No data available March 25<sup>th</sup> 10:30~12:19 Sea water injection to SFP via FPC March 26th 10:10 Started to inject fresh water to the Reactor Core. March 26th 16:46 Lighting in the Central Control Room was recovered. Reactor Pressure Vessel (RPV) March 27th 18:31 Switched to the water injection to the core using the temporary motor-driven pump. Temperature: March 29<sup>th</sup> 16:30~18:25 Switched to the temporary motor-driven pump injecting fresh water to SFP. Feedwater Nozzle Temperature March 29th 16:45~1st 11:50 Transferred the water from the Condensate Storage Tank (CST) to the 136.0°C Surge Tank of Suppression Pool Water (SPT) Temperature at the bottom head March 30th 9:25 ~ 23:50 Confirmed malfunction of the temporary motor-driven pump injecting fresh of RPV — °C (indicator failure) water to SFP(9:45). Switched to the injection using the fire pump Truck, but suspended as cracks were confirmed in the hose. (12:47, 13:10) Resumed injection of fresh water(19:05) April 1st 14:56~17:05 Freshwater injection to SFP via FPC using the temporary motor-driven pump. PCV\*3 Pressure 0.085MPa April 2<sup>nd</sup> around 9:30 The water, of which the dose rate was at the level of more than 1,000mSv/h, was Condition: No large confirmed to be collected in the pit located near the Intake Channel of Unit 2. The outflow from Possible damage fluctuation the lateral surface of the pit into the sea was also confirmed. of the suppression April 2<sup>nd</sup> 17:10 Started to transfer the water from the Condenser to the CST. April 3<sup>rd</sup> 12:12 The power supply to the temporary motor-driven pump was switched from the S/P\*4 Water Temperature A temporary power supply to the external power supply. 72.8 °C April 3<sup>rd</sup> 13:47~14:30 20 bags of sawdust, 80 bags of high polymer absorbent and 3 bags of cuttingprocessed newspaper were put into the Pit for the Conduit. S/P\*4 Water Temperature B External RHRS \*1 EDG\*2 April 4th 7:08~7:11 Approximately 13kg of tracer (bath agent) was put in from the Pit for the Duct for 73.0 °C Power Seawater Pipe. Condition: Tend to decrease April 4th 11:05~13:37 Freshwater injection to SFP via FPC using the temporary motor-driven pump. Injecting Power source car, S/P\*4 Pressure — MPa April 5<sup>th</sup> 14:15 Tracer is confirmed to outflow through the permeable layer around the pit into the sea. freshwater by Two lines **Temporary DGs** Condition: No data available 15:07 Started to inject coagulant. temporary motorsecured April 6<sup>th</sup> around 5:38 The water outflow from the lateral surface of the pit was confirmed to stopped. (indicator failure) driven pump April 7th 13:29 ~ 14:34 Freshwater injection to SFP via FPC using the temporary motor-driven pump. April 9th 13:10 Completed transferring the water from the Condenser to CST. \*1 Residual Heat Removal System April 10th 10:37 ~ 12:38 Freshwater injection to SFP via FPC using the temporary motor-driven pump. Current Conditions: Fresh water is \*2 Emergency Diesel Generator April 11th around 17:16 Loss of external power supply due to an earthquake occurred (at Hamadori in being injected to the Spent Fuel Fukushima Prefecture). Water injection to the Reactor Core was suspended. \*3 Primary Containment Vessel

April 11<sup>th</sup> 17:56 External power supply was recovered.

April 11th 18:04 Resumed injecting water to the Reactor Core.

(Editorial committee for Nuclear Energy Handbook, Nuclear Energy Handbook)

\*4 Suppression Pool

Pool and the Reactor Core

### Major Events after the Earthquake 2/2

April 12<sup>th</sup> 19:35~April 13<sup>th</sup> 17:04 Transfer from the trench of the turbine building to the Condenser.

April 13<sup>th</sup> 11:00 Suspended the transfer for checking leaks, etc.

April 13<sup>th</sup> 13:15~14:55 Freshwater injection to SFP via FPC using the temporary motor-driven pump.

April 16<sup>th</sup> 10:13~11:54 Freshwater injection to SFP via FPC using the temporary motor-driven pump. (The temporary motor-driven pump stopped at 11:39 due to an earthquake that occurred at around 11:19. SFP was confirmed to be filled to capacity through observing a rise of the water level in the Skimmer Tank.)

April 16<sup>th</sup> around 11:19 An earthquake occurred (in the southern part of Ibaraki Prefecture).

April 18<sup>th</sup> 13:42 Confirmed the situation in the reactor building using an unmanned robot.

April 18<sup>th</sup> 12:13~12:37 Stopped the water injection into the reactor core to replace the current hose with a new one.

April 18<sup>th</sup> 09:30~17:40 Injected coagulant (soluble glass) into the power cable trench.

April 19<sup>th</sup> 08:00~15:30 Injected coagulant (soluble glass) into the power cable trench.

April 19<sup>th</sup> 10:08 Started to transfer the stagnant water with high-level radioactivity from the trench of the turbine building to the buildings of radioactive waste treatment facilities.

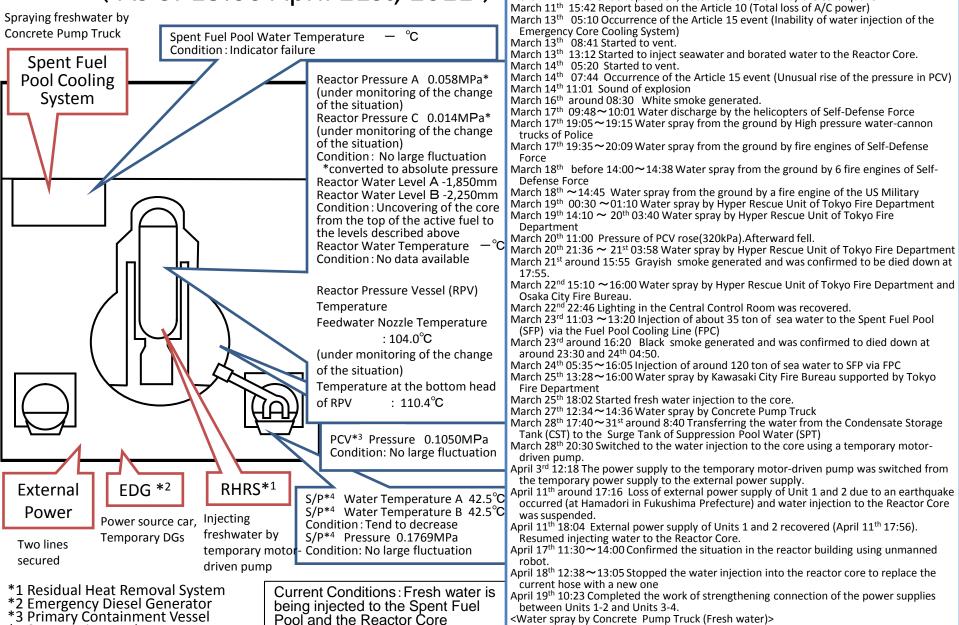
April 19<sup>th</sup> 10:23 Completed the work of strengthening connection of the power supplies between Units 1-2 and Units 3-4.

April 19<sup>th</sup> 16:08~17:28 Injected freshwater to SFP via FPC using the temporary motor-driven pump.

Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 3

( As of 13:00 April 21st, 2011 )

March 11th 14:46 Under Operation, Automatic shutdown by the earthquake



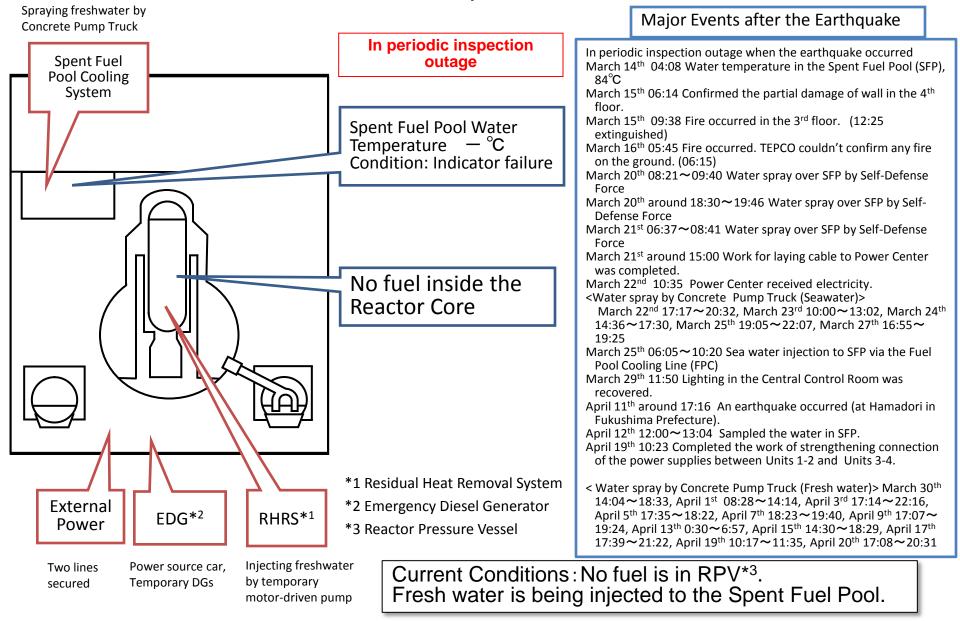
~19:19, April 7<sup>th</sup> 06:53 ~08:53, April 8<sup>th</sup> 17:06~20:00, April 10<sup>th</sup> 17:15~19:15, April

12<sup>th</sup> 16:26~17:16, April 14<sup>th</sup> 15:56~16:32, April 18<sup>th</sup> 14:17~15:02

\*4 Suppression Pool

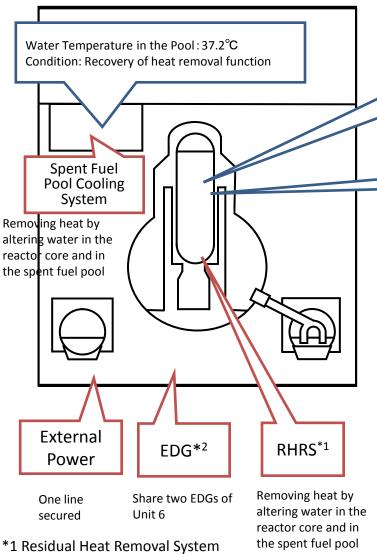
March 29<sup>th</sup> 14:17~18:18, March 31<sup>st</sup> 16:30~19:33, April 2<sup>nd</sup> 09:52~12:54, April 4<sup>th</sup> 17:03

### Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 4 ( As of 13:00 April 21st, 2011 )



### Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 5 ( As of 13:00 April 21st, 2011 )

### In periodic inspection outage



Reactor Pressure: 0.108MPa\* Reactor Water Level: 1.890mm Reactor Water Temperature: 42.7°C Condition: Pressure is under control. \*converted to absolute pressure

Reactor Pressure Vessel Temperature: Monitoring by Reactor Water Temperature

### Major Events after the Earthquake:

March 20th 14:30 Cold shutdown

March 21st 11:36 Receiving electricity from external power supply

March 23<sup>rd</sup> 17:24 Pump for Residual Heat Removal Seawater System (RHRS) was automatically stopped when the power supply was switched from the temporary to the permanent.

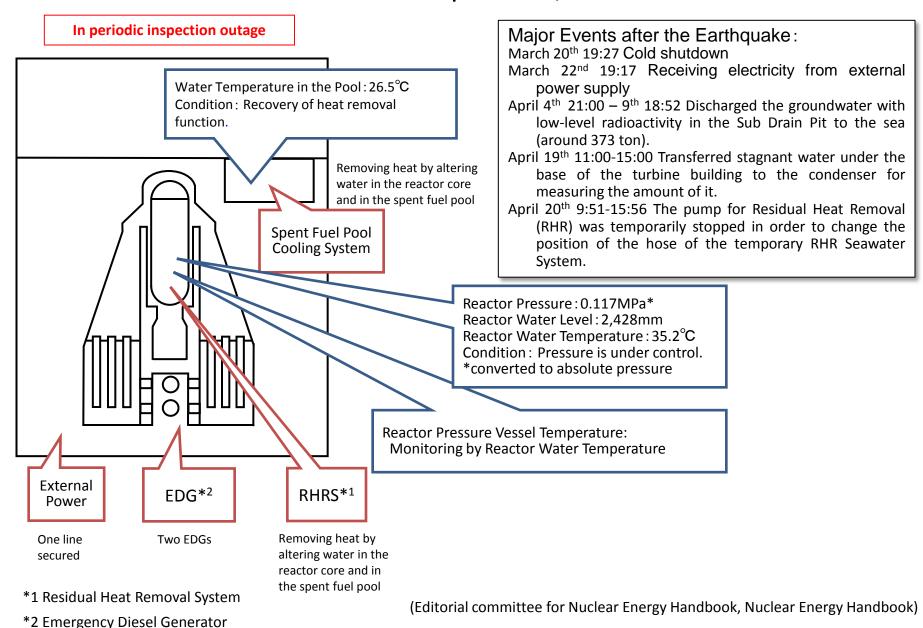
March 24th 16:14 Repair of the RHRS pump was completed.

March 24th 16:35 Started to cooling.

April 4<sup>th</sup> 21:00 – 8<sup>th</sup> 12:14 Discharged the groundwater with low-level radioactivity in the Sub Drain Pit to the sea (around 950 ton).

\*2 Emergency Diesel Generator

# Conditions of Fukushima Dai-ichi Nuclear Power Station Unit 6 ( As of 13:00 April 21st, 2011 )



#### Instructions

11:00 April 21, 2011

Attention to:
Governor of Fukushima prefecture,
Mayor of Hirono town,
Mayor of Naraha town,
Mayor of Tomioka town,
Mayor of Okuma town,

Prime Minister of Japan Head of 2011 Nuclear Emergency Response Headquarters Concerning Fukushima Dai-ichi and Dai-ni Nuclear Power Stations

In relation to the accident that occurred at Fukushima Dai-ni Nuclear Power Station (NPS) of Tokyo Electric Power Co. Inc. (TEPCO), the Nuclear Emergency Response Headquarters issues the following instructions in accordance with the provisions of the Article 20, paragraph 3 of the Act on Special Measures Concerning Nuclear Emergency Preparedness (Act No. 156 of 1999):

Residential and other area subject to evacuation shall be changed from residential and other area within 10km radius to residential and other area within 8km radius from TEPCO's Fukushima Dai-ni NPS.

Announcement shall be made to residents and others in the subject areas with the respective jurisdictions of each municipality.

#### Official Notice

April 21, 2011(11:00)

- 1. Areas subject to Emergency Response Measures
  - 8-km radius area from TEPCO's Fukushima Dai-ni Nuclear Power Station
- 2. Overview of the Nuclear Emergency

Date and time of emergency occurrence: March 12, 2011 (05:22)

Place of occurrence: Fukushima Dai-ni Nuclear Power Station of TEPCO

3. Matters for announcement to residents and others in area as described in 1.

That change shall be made to areas subject to evacuation from within 10-km radius to 8-km radius of Fukushima Dai-ni Nuclear Power Station of TEPCO.

### **News Release**



April 21, 2011 Nuclear and Industrial Safety Agency

Regarding the review of evacuation area of Fukushima Dai-ni Nuclear Power Station

While the Nuclear and Industrial Safety Agency (NISA) continues full efforts to address the accident of Fukushima Dai-ichi Nuclear Power Station (NPS) this time, the situation of all Units of Fukushima Dai-ni NPS has currently reached cold shutdown and is stable. The situation is also that, one month having gone by since the event, the amount of radioactive materials in the reactor has decreased to less than  $1/100^{\rm th}$  of that immediately after the shutdown, and decay heat has decreased to approximately several tithes.

Therefore, regarding Fukushima Dai-ni NPS, it is thought that probability of a major accident occurring in the future has significantly gone down and that, even in the event of an irregular situation by any chance, developments of events are expected to proceed at a slow pace, enabling to keep enough time to respond and effect on the peripheral environment is limited.

Furthermore, reliability of power supply and water injection functions at Fukushima Dai-ni is now considered to be secure to a certain degree, while not all equipments have been completed, since (1) Four circuits of external power supply have recovered and can receive electricity; (2) Two emergency Diesel Generators (DGs) are achieving standing by to every Unit including cross-shared DGs between Units; (3) There are 17 power-supply vehicles deployed to supply required power to every Unit; and (4) Eight pump trucks containing the required water volume are deployed in addition to one cooling system for purposes of cooling the reactor and the spent fuel pool.

Based on the above situation, the Nuclear Emergency Response Headquarters, hearing the opinion of the Nuclear Safety Commission, has made the decision to narrow the current evacuation area from within 10km radius to within 8km radius from Fukushima Dai-ni NPS, and issued the official notice as such (see attachment).

Consequently, evacuation instruction for area between8km radius and10 km radius from Fukushima Dai-ni NPS would be lifted, while area within 20km radius from

Fukushima Dai-ichi NPS continues to be treated as evacuation area. Also, as for the area that fall between 20km radius and 30km radius from Fukushima Dai-ichi NPS is treated as in house stay area.

Attachments: Instructions and Official Notice in accordance with provisions under the Article 20, paragraph 3 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

(Contact Person)

Mr. Toshihiro Bannai

Director, International Affairs Office,

NISA/METI

Phone:+81-(0)3-3501-1087

#### Instructions

07:00 April 21st 2011

Governor of Fukushima Prefecture Mayor of Tomioka Town Mayor of Futaba Town Mayor of Okuma Town Mayor of Namie Town Head of Kawauchi Village Mayor of Naraha Town Mayor of Minami-Soma City Mayor of Tamura City Head of Katsurao Village

> Director-General of Nuclear Emergency Response Headquarters of 2011 Fukushima Dai-ichi and Dai-ni Nuclear Power Stations Prime Minister

Regarding the accident occurred in Fukushima Dai-ichi Nuclear Power Station (NPS), Tokyo Electric Power Co. Inc. (TEPCO) pursuant to the provisions of Article 20, paragraph 3 of the Act on Special Measures Concerning Nuclear Emergency Preparedness (Act No.156 of 1999), instructions are given as follows:

### Instructions

In accordance with the attachment of "Regarding the Establishment of a Restricted Area" (On 21 April 2011 issued by the Nuclear Emergency Response Headquarter), to establish a restricted area as the area within the 20km radius from the Fukushima Dai-ichi NPS, TEPCO pursuant to the provisions of Article 63, paragraph 1 of the Disaster Countermeasures Basic Act (Act No. 223 of 1961) applied by replacing the terms and phrases pursuant to Article 28, paragraph 2 of the Act on Special Measures Concerning Nuclear Emergency Preparedness, and to prohibit the access to the area or to order to leave the area to any persons other than those engaged in emergency response measures, excluding the case that the mayor of the city or town or the head of the village permits the temporary access.

Hereafter, regarding this issue, to follow any new instructions given by the Director-General of Nuclear Emergency Response Headquarter of 2011 Fukushima Dai-ichi and Dai-ni NPSs.

Well inform the residents and so on in the subject area in each municipality of these contents.

#### <References>

- The Disaster Countermeasures Basic Act (Act No. 223 of 1961)
  - \* After being replaced the terms and phrases pursuant to Article 28, paragraph 2 of the Act on Special Measures Concerning Nuclear Emergency Preparedness (Act 156 of 1999)

(Right to establish a restricted area in a city, town or village)

- Article 63. <u>During the period from the issuance of a declaration of a nuclear emergency situation to the issuance of a declaration of the cancellation of a nuclear emergency situation, the mayor of the city or town or the head of the village may, when deemed necessary to prevent danger to life or limb, establish a restricted area to which access shall be restricted or prohibited to any persons other than those engaged in <u>emergency response measures</u>, or may order any persons other than those so engaged to leave the area.</u>
- 2. In cases described in the preceding paragraph, if the mayor of the city or town or the head of the village, or officials performing duties provided under that paragraph on his behalf are not on the scene, or if they request, police or maritime safety officials may perform the duties on their behalf. When such duties have been performed on behalf of the mayor of the city or town or the head of the village, the police or maritime safety officials shall immediately report their action to the mayor of the city or town or the head of the village.

### 3. (Omission)

Article 116. Any person who falls under either of the two items below shall be liable to a fine of up to one hundred thousand yen or detention:

- (1) (Omission)
- (2) Any person who has failed to comply with a ban, restriction or order for departure enforced by the mayor of a city or town or the head of a village under Article 63, paragraph 1 (including a prefectural governor acting on behalf of the mayor of a city or town or the head of a village under Article 73, paragraph 1), or by the police maritime safety officials under Article 63, paragraph 2 or by members of self defense troops dispatched for disaster relief under the provisions of Article 63, paragraph 1 as applied to Article 63, paragraph 3.

### Regarding the Establishment of a Restricted Area

April 21, 2011 Nuclear Emergency Response Headquarters

Pursuant to the provisions of Article 63, paragraph 1 of the Disaster Countermeasures Basic Act (Act No. 223 of 1961) replaced the terms and phrases pursuant to Article 28, paragraph 2 of the Act on Special Measures Concerning Nuclear Emergency Preparedness (Act No. 156 of 1999), the establishment of a restricted area by the mayor of the city or town or the head of the village and the restriction of access to the area to any persons other than those engaged in emergency response measures, shall be based on the following viewpoint.

- 1. Viewpoint on the Establishment of a Restricted Area
  - (1) Restricted Area
    - ① Policy
    - As the current state of the area where the directive to leave and evacuate had been issued, we have confirmed some residents and so on still remaining inside the area or accessing to the area. It is difficult to ensure safety for these persons and there is a concern that it may have a harmful influence to outside the area. Therefore, the aforementioned area shall be newly established as a restricted area, for the purpose of preventing danger to life or limb of the residents, etc.
    - 2 Plan of Establishment
    - The heads of the local governments concerned, receiving the instructions from the Director-General of Nuclear Emergency Response Headquarters pursuant to the provisions of Article 20, paragraph 3 of the Act on Special Measures Concerning Nuclear Emergency Preparedness, shall establish a restricted area pursuant to the provisions of Article 63, paragraph 1 of the Disaster Countermeasures Basic Act replaced the terms and phrases pursuant to Article 28, paragraph 2 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.
    - A restricted area is established as the one where the access is restricted. Any person other than those engaged in emergency response measures are restricted to access to the area. The permission criteria for temporary access shall be set forth separately by the Director-General of Nuclear Emergency Response Headquarters.

• In principle, some physical measures to prevent the access shall be taken in establishing a restricted area.

### (2) Date of Establishment

At zero in the morning on 22 April, 2011

### (3) Scope of the Area

The scope of a restricted area is within the area that the Director-General of Nuclear Emergency Response Headquarters has directed the local governments concerned to have residents and so on leave for evacuation, pursuant to the provisions of Article 20, paragraph 3 of the Act on Special Measures Concerning Nuclear Emergency Preparedness (Namely, the area within the 20km radius from Fukushima Dai-ichi Nuclear Power Station, including the sea area).

### 2. Coordination with the Police, etc.

The establishment of a restricted area needs to be ensured its effectiveness by inspections by the police, etc., in addition to the physical measures to prevent the access on the roads. For that reason, when issuing the instructions from the Director-General of Nuclear Emergency Response Headquarters pursuant to the provisions of Article 20 paragraph 3 of the Act on Special Measures Concerning Nuclear Emergency Preparedness, close coordination shall be made with the police, etc.

### (Reference)

<Legal Effects of Establishment of a Restricted Area>

• Disobeying the restriction of the access to a restricted area shall be liable to a fine of not more than one hundred thousand yen or detention. (Article 116 of the Disaster Countermeasures Basic Act replaced the terms and phrases pursuant to Article 28, paragraph 1 of the Act on Special Measures Concerning Nuclear Emergency Preparedness)