

March 17, 2011

Nuclear and Industrial Safety Agency

Seismic Damage Information (the 27th Release)
(As of 07:30 March 17th, 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. Tokai Dai-ni NPS, Japan Atomic Power Co., Inc, as follows:

Major updates are as follows.

1. Nuclear Power Stations (NPS)

● Fukushima Dai-ichi NPS

- The white smoke like steam generated from Unit 3. (08:30 March 16th)
- Because of the possibility that the Primary Containment Vessel (PCV) of Unit 3 was damaged, the operators evacuated from the central control room of Unit 3 and 4 (a sheared facility). (10:45 March 16th) Thereafter the operators returned to the room and restarted the operation for water injection. (11:30 March 16th)
- The fire at Unit 4 occurred. (05:45 March 16th) TEPCO reported that no fire could be confirmed on the ground. (06:15 March 16th)
- The electrical cables for receiving electricity from the transmission line of Tohoku Electric Power Co. are planned to be installed (07:30 March 17th)
- The procedures for spraying water into the spent fuel pool of Unit 3 are being checked. (07:00 March 17th)

2. Actions taken by NISA

(March 15th)

22:00 According to the Nuclear Regulation Act, Minister of Economy, Trade and Industry issued the following directive.

For Unit 4: To implement the injection of water to the Spent Fuel

Storage Pool.

<Situation of the injured>

- As for the member of Self-Defense Force (a person) who was injured due to the explosion at Unit 3 of Fukushima Dai-ichi NPS and was transported to National Institute of Radiological Sciences, the examination resulted in no internal exposure. The member was discharged from the institute on March 16th.

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(Attached sheet)

1. The status of operation at NPS (Number of automatic shutdown units: 10)

- Fukushima Dai-ichi NPS, Tokyo Electric Power Co. Inc. (TEPCO)
(Okuma-machi and Futaba-machi, Futaba-gun, Fukushima Prefecture)

(1) The status of operation

Unit 1 (460MWe): automatic shutdown
 Unit 2 (784MWe): automatic shutdown
 Unit 3 (784MWe): automatic shutdown
 Unit 4 (784MWe): in periodic inspection outage
 Unit 5 (784MWe): in periodic inspection outage
 Unit 6 (1,100MWe): in periodic inspection outage

(2) Major Plant Parameters (04:00 March 17th)

	unit	Unit 1	Unit 2	Unit 3
Reactor Pressure	MPag	0.198 (A) 0.151(B)	— 0.065(A) — 0.079(B)	0.023 (A) 0.032(A)
CV Pressure	KPa	Not available	75	200
Reactor Water Level	mm	— 1,800(A) — 1,750(B)	— 1,400(A) Not available(B)	— 1,950(A) — 2,300(B)
Suppression Pool Water Temperature	℃	Not available	Not available	Not available
Suppression Pool Pressure	kPa	Not available	down scale	down scale
Measuring time		03:10 March 17th	03:10 March 17th	03:20 March 17th

(3) Report concerning other incidents

- TEPCO reported to NISA the Event in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi. (15:42 March 11th)

- TEPCO reported to NISA the event in accordance with the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi, Units 1 and 2.(16:36 March 11th)

<Unit 1>

- Seawater was injected to the Containment Vessel via the Fire Extinguishing System Line (Started up 11:55 March 13th)
→Temporary interruption of the injection (01:10 March 14th)
- The sound of explosion in Unit 1 occurred. (15:36 March 12nd)
- Seawater is being injected as of 04:00 March 17th.

<Unit 2>

- Water injection function was sustained. (14:00 March 13th)
- Reactor water level was decreasing. (13:18 March 14th)
- Seawater injection to the Reactor Pressure Vessel (RPV) was ready through the Fire Extinguishing System line. (19:20 March 14th)
- TEPCO evaluated core damage of Unit 2 was “less than 5%” (22:14 March 14th)
- Water level in RPV in Unit 2 is decreasing. (22:50 March 14th)
- A sound of explosion was made in Unit 2. As the pressure in Suppression Chamber decreased, there was a possibility that an incident occurred in the Chamber. (06:20 March 15th)
- Seawater is being injected as of 04:00 March 17th.

<Unit 3>

- Fresh water was injected to the PCV via the Fire Extinguishing System Line (FESL). (11:55 March 13th)
- Seawater was injected to the PCV via FESL. (13:12 March 13th)
- Injection of seawater for Unit 1 and Unit 3 into PCV was interrupted due to the lack of seawater in pit. (01:10 March 14th)
- For Unit 3 injection of seawater into PCV was restarted (03:20 March 14th)
- For Unit 3 the pressure increased unusually. (11:45 March 14th)
- For Unit 3 the explosion like Unit 1 occurred around the Reactor

Building (11:01 March 14th)

- The white smoke like steam generated from Unit 3. (08:30 March 16th)
- Because of the possibility that the PCV of Unit 3 was damaged, the operators evacuated from the central control room of Unit 3 and 4 (a sheared facility). (10:45 March 16th) Thereafter the operators returned to the room and restarted the operation for water injection. (11:30 March 16th)
- Seawater is being injected as of 04:00 March 17th.

<Unit 4>

- It was confirmed that a part of wall in the operation area of Unit 4 was damaged. (06:14 March 15th)
- The fire at Unit 4 occurred. (09:38 March 15th) TEPCO reported that the fire was extinguished spontaneously. (11:00 March 15th)
- The temperature of water in the Spent Fuel Storage Pool at Unit 4 had increased.
(84 °C at 04:08 March 14th)
- The fire occurred at Unit 4. (5:45 March 15th) TEPCO reported that no fire could be confirmed on the ground.(06:15 March 16th)
- The water injection is suspended as of 04:00 March 17th.

● Fukushima Dai-ni Nuclear Power Station (TEPCO)

(Naraha-machi/Tomioka-machi, Futaba-gun, Fukushima pref.)

(1) The status of operation

Unit1 (1,100MWe): automatic shutdown, cold shut down at 17:00,
March 14th

Unit2 (1,100MWe): automatic shutdown, cold shut down at 18:00,
March 14th

Unit3 (1,100MWe): automatic shutdown, cold shut down at 12:15,
March 12th

Unit4 (1,100MWe): automatic shutdown, cold shut down at 07:15,
March 15th

(2) Major plant parameters (As of 06:00, 17 March)

	unit	Unit 1	Unit 2	Unit 3	Unit 4
Reactor Pressure	MPag	0.09	0.04	0.04	0.09
Reactor water temperature	℃	48.9	46.8	27.3	45.0
Reactor water level*	mm	10,446	11,096	7,523	9,026
Suppression pool water temperature	℃	36	29	43	45
Suppression pool pressure	kPa	136	125	130	147
Remarks		cold shutdown	cold shutdown	cold shutdown	cold shutdown

*: Distance from the top of fuel

(3) Report concerning other incidents

- TEPCO reported to NISA the event in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ni Unit 1. (18:08 March 11th)
- TEPCO reported to NISA the events in accordance with the Article 10 regarding Units 1, 2 and 4. (18:33 March 11th)

● Onagawa NPS (Tohoku Electric Power Co., Inc.)

(Onagawa-cho, Oga-gun and Ishinomaki-shi, Miyagi Prefecture)

(1) The status of operation

Unit 1 (524MWe): automatic shutdown, cold shut down at 0:58, March 12th

Unit 2 (825MWe): automatic shutdown, cold shut down at earthquake

Unit 3 (825MWe): automatic shutdown, cold shut down at 1:17, March 12th

(2) Readings of monitoring post

Reading of monitoring post:

MP2 (Monitoring at the North End of Site Boundary)

approx. 6,500 nGy/h (19:00 March 14th)

→approx. 5,400 nGy/h (19:00 March 15th)

(3) Report concerning other incidents

- Fire Smoke on the first basement of the Turbine Building was extinguished. (22:55 on March 11th)
- Reported on the Article 10* of the Act on Special Measures Concerning Nuclear Emergency Preparedness (13:09 March 13th)

2. Action taken by NISA

(March 11th)

- 14:46 Set up of the NISA Emergency Preparedness Headquarters (Tokyo) immediately after the earthquake
- 15:42 TEPCO reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.
- 16:36 TEPCO judged the event in accordance with the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS, Units 1 and 2. (reported to NISA at 16:45)
- 18:08 Regarding Unit 1 of Fukushima Dai-ichi NPS, TEPCO reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.
- 18:33 Regarding Units 1,2 and 4 of Fukushima Dai-ichi NPS, TEPCO reported to NISA in accordance with the Article 10 of Act on Special Measures Concerning Nuclear Emergency Preparedness.
- 19:03 Government declared the state of nuclear emergency. (Establishment of Government Nuclear Emergency Response Headquarters and Local Emergency Response Headquarters)
- 20:50 Fukushima Prefecture's Emergency Response Headquarters issued a direction for the residents within 2 km radius from Unit 1 of Fukushima Dai-ichi NPS to evacuate. (The population of this area is 1,864)
- 21:23 Directives from Prime Minister to the Governor of Fukushima Prefecture, the Mayor of Ooka Town and the Mayor of Futaba Town were issued regarding the event occurred at Fukushima Dai-ichi NPS, TEPCO, in accordance with the Paragraph 3, the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness as follows:

-Direction for the residents within 3km radius from Unit 1 to evacuate.

-Direction for the residents within 10km radius from Unit 1 to stay in-house.

24:00 Vice Minister of Economy, Trade and Industry, Ikeda arrived at the Local Emergency Response Headquarters

(March 12th)

05:22 Regarding Unit 1 of Fukushima Dai-ni NPS, TEPCO reported to NISA in accordance with the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

05:32 Regarding Unit 2 of Fukushima Dai-ni NPS, TEPCO reported to NISA in accordance with the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

05:44 Residents within 10km radius from Unit 1 of Fukushima Dai-ichi NPS shall evacuate by the Prime Minister Direction.

06:07 Regarding of Unit 4 of Fukushima Dai-ni NPS, TEPCO reported to NISA in accordance with the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

06:50 In accordance with the Paragraph 3, the Article 64 of the Nuclear Regulation Act, the order was issued to control the internal pressure of the Containment Vessel of Units 1 and 2 of Fukushima Dai-ichi NPS.

07:45 Directives from Prime Minister to the Governor of Fukushima Prefecture, the Mayors of Hirono Town, Naraha Town, Tomioka Town and Ookuma Town were issued regarding the event occurred at Fukushima Dai-ni NPS, TEPCO, pursuant to the Paragraph 3, the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness as follows:

-Direction for the residents within 3km radius from Fukushima Dai-ni NPS to evacuate.

-Direction for the residents within 10km radius from Fukushima Dai-ni NPS to stay in-house

17:00 TEPCO reported to NISA in accordance with the Article 15 of the Act

on Special Measure Concerning Nuclear Emergency Preparedness since the radiation level at Fukushima Dai-ichi NPS exceeded the acceptable limit.

17:39 Prime Minister directed evacuation of the residents within the 10 km radius from Fukushima Dai-ichi NPS

18:25 Prime Minister directed evacuation of the residents within the 20km radius from Fukushima Dai-ichi NPS

19:55 Directives from Prime Minister was issued regarding seawater injection to Unit No.1 of Fukushima Dai-ichi NPS.

20:05 Considering the Directives from Prime Minister and pursuant to the Paragraph 3, the Article 64 of the Nuclear Regulation Act, order was issued to inject seawater to Unit 1 of Fukushima Dai-ichi NPS.

20:20 At Unit 1 of Fukushima Dai-ichi NPS, seawater injection started.

(March 13th)

05:38 TEPCO reported to NISA pursuant to the Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness since Unit 3 of Fukushima Dai-ichi NPS lost total coolant injection function. Recovering efforts by TEPCO of the power source and coolant injection function and work on venting are underway.

09:08 Pressure suppression in the Containment Vessel and fresh water injection started at Unit 3 of Fukushima Dai-ichi NPS.

09:20 Opening of Pressure vent valve of Unit 3 of Fukushima Dai-ichi NPS.

09:30 The order was issued for the Governor of Fukushima Prefecture, the Mayors of Ookuma Town, Futaba Town, Tomioka Town and Namie Town in accordance with the Act on Special Measures Concerning Nuclear Emergency Preparedness on the contents of radioactivity decontamination screening.

09:38 TEPCO reported to NISA that Unit 1 of Fukushima Dai-ichi NPS reached a situation specified in the Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness.

13:09 Tohoku Electric Power Company reported to notified that Onagawa NPS reached a situation specified in the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

13:12 Fresh water injection was switched to seawater injection at Unit 3 of Fukushima Dai-ichi NPS.

14:25 TEPCO reported to NISA that Fukushima Dai-ichi NPS reached a situation specified in the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

(March 14th)

01:10 Seawater injection at Unit 1 and Unit 3 of Fukushima Dai-ichi NPS were temporarily interrupted due to the lack of seawater in pit.

03:20 Seawater injection at Unit 3 of Fukushima Dai-ichi NPS was restarted.

04:24 TEPCO reported to NISA that Fukushima Dai-ichi NPS reached the situation specified in the Article 15 of Act on Special Measures Concerning Nuclear Emergency Preparedness.

07:53 TEPCO reported to NISA that Fukushima Dai-ichi NPS reached the situation specified in the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

13:25 TEPCO reported to NISA that Fukushima Dai-ichi Unit 2 of NPS reached the situation specified in the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.

22:13 TEPCO reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

22:35 TEPCO reported to NISA in accordance with the Article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Fukushima Dai-ichi NPS.

(March 15th)

00:00 The acceptance of experts from IAEA was decided.

NISA agreed to accept the offer of dispatching of the expert on NPS damage from IAEA considering the intention by Mr. Amano, Director General of IAEA. Therefore, the schedule of expert acceptance will be planned from now on according to the situation.

00:00 NISA also decided the acceptance of experts dispatched from NRC.

07:24 JAEA reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding, Tokai Research and Development Centre, Nuclear Fuel Cycle Engineering Laboratories.

- 07:44 JAEA reported to NISA in accordance with the Article 10 of the Act on Special Measures Concerning Nuclear Emergency Preparedness regarding Nuclear Science Research Institute.
- 10:30 According to the Nuclear Regulation Act, Minister of Economic, Trade and Industry issued the directives as follows.
- For Unit 4: To extinguish fire and to prevent the occurrence of re-criticality
- For Unit 2: To inject water to reactor vessel promptly and to vent Drywell.
- 10:59 Considering the possibility of lingering situation, it is decided that the function of the Local Emergency Response Headquarter is moved to the Fukushima Prefectural Office.
- 11:00 Prime Minister directed the in-house stay area.
- In-house stay was additionally directed to the residents in the area from 20 km to 30 km radius from Fukushima Dai-ichi NPS considering in-reactor situation.
- 22:00 According to the Nuclear Regulation Act, Minister of Economy, Trade and Industry issued the following directive.
- For Unit 4: To implement the injection of water to the Spent Fuel Storage Pool.

< Possibility on radiation exposure (As of 7:30 March 17th) >

<Exposure of residents>

- (1) Including the evacuees from Futaba Public Welfare Hospital to Nihonmatsu City Fukushima Gender Equality Centre as the result of measurement of 133 persons at the Centre, 23 persons counted more than 13,000 cpm were decontaminated.
- (2) The 35 residents transferred from Futaba Public Welfare Hospital to Kawamata Town Saiseikai Hospital by private bus arranged by Fukushima Prefecture were judged to be not contaminated by the Prefectural Response Centre.
- (3) As for the about 100 residents in Futaba Town evacuated by bus, the results of measurement for 9 of the 100 residents were as follows. The

evacuees were divided into two groups which joined later to Nihonmatsu City Fukushima Gender Equality Centre.

No. of Counts	No. of Persons
18,000cpm	1
30,000-36,000cpm	1
40,000cpm	1
little less than 40,000cpm*	1
very small counts	5

*(These results were measured without shoes, though the first measurement exceeded 100,000cpm)

(4)The screening was started at the Off site Center in Okuma Town from March 12th to 15th. 162 people received examination until now. At the beginning, the reference value was set at 6,000cpm. 110 people were at the level below 6,000 cpm and 41 people were at the level of 6,000 cpm or more. When the reference value was increased to 13,000 cpm afterward, 8 people were at the level below 13,000 cpm and 3 people are at the level of 13,000 cpm or more.

The 5 out of 162 people examined were transported to hospital after being decontaminated.

(5)The Fukushima Prefecture carried out the evacuation of patients and personnel of the hospitals located within 10km area. The screening of all the members showed that 3 persons have the high counting rate. These members were transported to the secondary medical institute of exposure. As a result of the screening on 60 fire fighting personnel involved in the transportation activities, the radioactivity higher than twice of the back ground was detected on 3 members even after decontamination and all the 60 members were decontaminated.

<Exposure of workers>

(1) As for the 18 workers conducting operations in Fukushima Dai-ichi NPS, results of measurements are as follows;

One worker; 106.3 mSv. At the level of exposure no internal exposure and medical treatment was not required.

Other workers: No threat of internal exposure and no medical treatment needed.

- (2) The 6 out of 7 people working at the time of explosion at the Unit 3 of Fukushima Dai-ichi NPS injured and were conscious. The detailed measurement data are not available.

<Others>

- (1) Fukushima Prefecture has started the screening from 13 March at two health office in the prefecture. It is undertaken at 12 evacuation sites, 7 health offices, etc. The results of screening are being totalled up.
- (2) 5 members of Self-Defence Force who worked for water supply in Fukushima Dai-ichi NPS were exposed. After the work (March 12th), 30,000 cpm was counted by the measurement at Off site Centre. The counts after decontamination were between 5,000 and 10,000 cpm. One member was transferred to National Institute of Radiological Science. No other exposure of the Self-Defence Force member was confirmed at the Ministry of Defence.
- (3) As for policeman, the decontaminations of two policemen were confirmed by the National Police Agency. Nothing unusual was reported.

<Direction of administrating stable Iodine during evacuation>

On March 16th, the Local Emergency Response Headquarter issued “the direction to administer the stable Iodine during evacuation from the evacuation area (20 km radius)” to the Prefecture Governors and the heads of cities, towns and villages (Tomioka town, Hutaba town, Okuma town, Namie town, Kawauchi village, Naraha town, Minamisouma city, Tamura city, Kazurao village, Hirono town, Iwaki city and Iidate village).

<Situation of the injured (As of 07:30 March 16th)>

1. Injury due to earthquake
- Two employees (slightly)
 - Two subcontract employees (one fracture in both legs)
 - Two missing (TEPCO's employee, missing in the turbine building of Unit 4)

- One emergency patient (According to the local prefecture, one patient of cerebral infarction was transported by the ambulance).
 - Ambulance was requested for one employee complaining the pain at left chest outside of control area (conscious).
 - Two employees complaining discomfort wearing full-face mask in the main control room were transported to the industrial doctor of Fukushima Dai-ni NPS.
2. Injury due to the explosion of Unit 1 of Fukushima Dai-ichi NPS
- Four employees were injured at the explosion and smoke of Unit 1 around turbine building (out of control area). Examined by Kawauchi clinic.
3. Injury due to the explosion of Unit 3 of Fukushima Dai-ichi NPS
- Four TEPCO's employees
 - Three subcontractor employees
 - Four members of Self-Defence Force (one of them was transported to National Institute of Radiological Sciences considering internal possible exposure. The examination resulted in no internal exposure. The member was discharged from the institute on March 16th.)

<Situation of Resident Evacuation (As of 7:30 March 17th)>

At 11:00 March 15th, Prime Minister directed in-house stay to the residents in the area from 20 km to 30 km radius from Fukushima Dai-ichi NPS. The directive was conveyed to Fukushima Prefecture and related municipalities.

Regarding the evacuation as far as 20-km from Fukushima Dai-ichi NPS and 10-km from Fukushima Dai-ni, necessary measures have already been taken.

- The in-house stay in the area from 20 km to 30 km from Fukushima Dai-ichi NPS is made fully known to the residents concerned.
- Cooperating with Fukushima Prefecture, livelihood support to the residents in the in-house stay area are implemented.

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