

Improvement Program for the Enhancement of the In-House
Firefighting System and for the Establishment of a Rapid and
Accurate Accident Reporting System
in Light of the 2007 Niigata-Chuetsu-Oki Earthquake

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The Tokyo Electric Power Company, Inc. (TEPCO)

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1. Purpose

In response to the order issued by the Minister of Economy, Trade and Industry entitled "Reponses based on the 2007 Niigata-Chuetsu-Oki Earthquake (instructions)" (dated July 20, 2007, Nuclear No. 1), The Tokyo Electric Power Company, Inc. (TEPCO) will establish an improvement program for the enhancement of the in-house firefighting system and for the establishment of a rapid and accurate accident reporting system at its nuclear power stations.

2. Subjects of examination

Per the order issued by the Minister of Economy, Trade and Industry entitled "Reponses based on the 2007 Niigata-Chuetsu-Oki Earthquake (instructions)" (dated July 20, 2007, Nuclear No. 1), subjects of examination for the enhancement of the in-house firefighting system and for the establishment of a rapid and accurate accident reporting system in TEPCO nuclear power stations are as follows.

2-1. Examination of "Enhancement of the In-house Firefighting System"

- (A) Examination related to ensuring rapid response of sufficient personnel when a fire breaks out.
- (B) Examination of emplacement of chemical fire engines, etc., in preparation for oil fires and so on at nuclear power stations.
- (C) Examination of establishing a dedicated firefighting hotline.
- (D) Examination of enhanced training for relevant personnel, through cooperation with fire departments and including practical training with them.

2-2. Examination of "Establishment of a Rapid and Accurate Accident Reporting System"

- (A) Examination of the swift establishment of a system that can ensure the necessary personnel to confirm the facts related to leakage of radioactive material and so on even during an earthquake or other disaster.
- (B) Examination of ensuring means of communication within the nuclear power station and between the nuclear power station and the disaster management headquarters that will function reliably even during an earthquake or other disaster.
- (C) Examination of timely reporting to the national and local governments when the possibility of leakage of radioactive material has been acknowledged.

3. Extraction of problem areas and response guidelines

In response to the order issued by the Nuclear and Industrial Safety Agency entitled "Ensuring the Safety of the Kashiwazaki-Kariwa Nuclear Power Station Struck by the 2007 Niigata-Chuetsu-Oki Earthquake" (dated July 16, 2007, No. 2), TEPCO compiled "Issues and

Future Response Guidelines Related to the Fire in Kashiwazaki-Kariwa Unit 3 House Transformer (B)" regarding its response to the fire in a house transformer in Unit 3 of the Kashiwazaki-Kariwa Nuclear Power Station and "Causes of the Delay in Reporting the Water Leak in an Uncontrolled Area of Kashiwazaki-Kariwa Unit 6 and Future Response Guidelines elucidating the causes of the delay in reporting the water leak in an uncontrolled area of Kashiwazaki-Kariwa Unit 6. TEPCO submitted these reports to the Nuclear and Industrial Safety Agency on July 20, 2007.

The issues extracted therein and the response guidelines are as follows.

TEPCO will address these issues as shared concerns of the Fukushima Daiichi Nuclear Power Station and the Fukushima Daini Nuclear Power Station as well, rather than as issues only for the Kashiwazaki-Kariwa Nuclear Power Station.

3-1. Current problem areas and response guidelines for "Enhancement of the In-house Firefighting System"

- (A) The method of summoning the in-house firefighting team was inadequate due to congestion of communications immediately following the earthquake, and TEPCO's firefighting activities until the arrival of the fire department were insufficient. In light of these facts, TEPCO will examine enhancing the in-house firefighting team, including always having them on-site, in order to implement more effective and reliable initial firefighting activities.
- (B) Firefighting activities were insufficient due to damage to outdoor fire hydrants, and fire extinguishers for oil fires were inadequate. In light of this, TEPCO will examine emplacement of chemical fire engines and operating technicians familiar with them as a measure for redundant fire extinguishing equipment and enhanced ability to respond to oil fires. Furthermore, TEPCO will examine backup functions such as mobile powder fire extinguishers.
- (C) It remained difficult to connect to the fire-emergency 119 number, preventing contact with fire department, and the hotline was not utilized effectively. TEPCO will therefore examine a reconsideration of reliable means of communication and contact with the fire department, including hotlines.
- (D) Alternatives to fire hydrants could not be utilized and human safety. TEPCO will thus examine a reconsideration of familiarization, thoroughness, education, and training regarding fire extinguishers and apparatuses.

3-2. Current problem areas and response guidelines for "Establishment of a Rapid and Accurate Accident Reporting System"

- (A) There were no personnel to take appropriate samples from water puddles and test them properly for radioactivity, and the proper response when such personnel are unavailable was

unclear. In light of this, TEPCO will examine steps to enable staff members other than radiation management personnel to take appropriate samples and measure radioactivity during emergencies so that bulletins can be promptly issued.

- (B) Regarding means of communication within the nuclear power station and between the nuclear power station and the disaster management headquarters when an earthquake occurs, it became necessary to immediately evacuate the Administration Office Building, and earthquake damage to doors initially made it difficult to enter the plant's emergency response room. This made it impossible to quickly prepare the whiteboards and internal telephones (PHS) necessary for sharing information within the plant and the company as part of the initial response. Even after some PHS units were secured from the Administration Office Building, which received relatively less damage, most of the numbers were different from the ones that plant personnel usually used, so it took time to look up numbers when TEPCO headquarters attempted to contact the plant. Moreover, the videoconferencing system inside the emergency response room experienced technical issues because of the earthquake, and the intranet was out of order. This degraded information sharing and cooperation inside and outside TEPCO.

As for the PHS system, it uses a dedicated internal line, so there was no difficulty using it to communicate with the nuclear power station and between the station and the disaster management headquarters.

Based on the above situation, TEPCO will examine methods of ensuring means of communication that function reliably when there is an earthquake or other disaster.

- (C) Because it is possible that radioactive material in water puddles in the uncontrolled area could have been detected by radioactivity measurement earlier than the measurement that did confirm detection, TEPCO will examine, from the perspective of promptly issuing bulletins, responses when the possibility of detection of radioactive material exists. At the same time, TEPCO will examine from the same perspective of prompt bulletin issuance responses when the possibility of release of radioactive material outside the plant exists.

4. Improvement program

As a result of examination based on “3. Extraction of Problem Areas and Response Guidelines”, TEPCO will make improvements regarding various issues as follows.

4-1. Improvement program for "Enhancement of the In-house Firefighting System"

- (A) In order to move towards more reliable implementation of initial fire extinguishing activities during complex disasters such as earthquakes with fires, TEPCO will first increase the current number of full-time employees and contracted employees in order to form a three-shift, 24-hour firefighting crew for outdoor firefighting activities (targeted for August

2007). At the same time, TEPCO will implement ongoing education and training, working to steadily improve skill and expand the scope of firefighting response.

Furthermore, TEPCO will examine ordering the securing of at least 10 people, including an initial firefighting support system of shift operators, and the scope of firefighting response. The results of that examination will be reflected in operation of the power station (targeted completion in FY 2007).

- (B) First, along with prioritizing the placement of chemical fire engines (targeted for August 2007), full-fledged operation will begin once skills have been acquired through education and training (targeted for October 2007). In addition, large fire extinguishers will be put in place as backups to existing in-plant fire extinguishing equipment (targeted for October 2007).

Furthermore, to back up outdoor fire extinguishing equipment, TEPCO will deploy a fire engine equipped with a water tank (targeted for FY 2007). In addition, TEPCO will reevaluate the reliability of firefighting equipment, including its earthquake resistance, and set forth further improvement policies (targeted completion in FY 2007).

- (C) First, in order to ensure that the emergency response room's dedicated communication line to the fire department will function reliably in an earthquake or other disaster, TEPCO will thoroughly retrain employees in its use (targeted for August 2007).

Furthermore, through discussions with the local fire department on reexamining the methods of using the dedicated line, another terminal will be added in the main control room (targeted for October 2007).

- (D) Regarding current joint training with the fire department, TEPCO will move to more realistic training plans in cooperation with the local fire department (targeted completion in FY 2007).

4-2. Improvement program for "Establishment of a Rapid and Accurate Accident Reporting System"

- (A) TEPCO will establish a system that enables accurate and rapid sampling and radioactivity measurement of leaked radioactive material even during an earthquake or other disaster that occurs at night or on a holiday.

First, at night and on holidays, as many personnel as currently available from radiation-related sections (groups in charge of radiation and chemical management, radiation safety, and environment) and personnel in charge of radioactivity measurement (contracted) will be assigned inside the plant (or in the neighborhood). In addition, TEPCO will implement training so that shift operators can perform sampling, with operations beginning as soon as they are ready (targeted for August 2007).

Eventually, personnel from radiation-related sections and personnel in charge of radiation

measurement are to be assigned within the plant as necessary personnel. TEPCO will also examine adjustment of the appropriate number of personnel, concrete means to secure personnel, systematic orders and directions, and utilization of shift operators if enough appropriate personnel cannot be found. At the same time, TEPCO is preparing manuals with detailed response methods, carrying out necessary training for relevant personnel, and reflecting these initiatives in operation of the plant (targeted for December 2007).

- (B) Because it is vital that communications methods in the emergency response room function reliably, TEPCO will first reexamine and establish permanent facilities and equipment (information and communications devices such as the videoconferencing system and PHS units) in the emergency response room (targeted for September 2007).

Furthermore, in order to enhance the emergency response room, it will be evaluated for earthquake resistance and other aspects of reliability. This will be reflected in its design, and seismic strengthening will be carried out (targeted for completion in FY 2009).

- (C) Regarding leakage in controlled areas, TEPCO will continue working for rapid bulletin issuance. In addition, as measures to improve upon the performance during the recent leakage in an uncontrolled area, when leakage is discovered in an uncontrolled area and it is possible that it contains radioactive material from the plant, TEPCO will issue a bulletin stating, "There is possible leakage of radioactive material in the uncontrolled area (currently under investigation)." in order to ensure prompt reporting. Furthermore, TEPCO will identify potential discharge routes from uncontrolled areas in advance and in case leakage in the uncontrolled area is confirmed as containing radioactive material, TEPCO will thoroughly consider the possibility of accidental discharge of radioactive material outside the plant, immediately quarantine the discharge route, and issue a bulletin. In addition, TEPCO will clarify its thinking on the scope of measurement when leakage is detected in an uncontrolled area (targeted for August 2007).

*The possibility that radioactive material from the plant is contained in leakage will be recognized when:

- Inclusion of radioactive material is conceivable, or
- Radioactive material is detected in other measurements even before results can be obtained from measuring the amount of leakage, etc.