

## XI. Responses at Other Nuclear Power Stations

### 1. Emergency safety measures at other NPSs in light of the accident at Fukushima Dai-ichi and Fukushima Dai-ni NPSs

Although the frequency of the occurrence of an extremely large tsunami caused by massive earthquake is deemed to be substantially small, the impact of such a tsunami on NPSs may be extensive. Hence, based on our newfound knowledge, we have decided to take emergency safety measures first to minimize as much as possible the release of radioactive materials as well as to restore cooling functions at all NPSs, other than Fukushima Dai-ichi and Fukushima Dai-ni NPSs. We have decided to prevent the occurrence of reactor core damage, etc. due to loss of all AC power, etc. and the occurrence of a nuclear emergency because of such damage, by ensuring that nuclear operators and other organizations are appropriately committed to implementing emergency safety measures and that the Nuclear and Industrial Safety Agency (NISA) confirms such measures through inspections, etc.

NISA is committed to improve the reliability of emergency safety measures continuously by ensuring that such measures are appropriately taken through conducting inspections and other measures, encouraging nuclear operators to undertake necessary improvements, and incorporating newfound knowledge in the future, etc.

#### (1) Details of emergency safety measures

The following issues, which were caused by the massive tsunami accompanying the earthquake, seem to be the direct causes for expansion of the Fukushima Dai-ichi NPS accident, the occurrence of the nuclear emergency and the expansion of the scale of the emergency:

- 1) The loss of the external power supply as well as the inability to secure emergency power supply.
- 2) The loss of the function of the seawater system to finally discharge to the sea the heat of the reactor cores after the shutdown of the reactors.
- 3) The inability to flexibly supply cooling water when water for cooling the spent fuel pool and usual on-site water supply into the pool stopped.

On March 30, 2011, NISA amended its ministerial ordinance (Requirements of Safety Regulations) and took other measures, to request all nuclear power stations (other than Fukushima Dai-ichi and Dai-ni NPSs) to enhance their safety measures as follows. The implementation status of these measures (including future plans) were requested to be submitted to NISA within about one month (by the end of April 2011).

a. Regulatory requirements

Even if all three major functions (all AC power supply, seawater cooling function and spent fuel pool cooling function) are lost due to a tsunami, damage to the reactor core and the spent fuels should be prevented and cooling functions should be restored along with controlling the release of radioactive materials.

b. Specific requirements

(a) Implementation of emergency checking

Emergency checking of equipment and facilities to be used for tsunami-related emergencies should be implemented.

(b) Checking of emergency response plans and implementation of training

Checking of emergency response plans and training assuming that all AC power supply, the seawater cooling function and the spent fuel pool cooling function are lost should be implemented.

(c) Securing emergency power supply

When the on-site power supply is lost and the emergency power supply is not available, an alternative power supply should be secured to flexibly provide the necessary power.

(d) Securing final heat removal functions in an emergency

Preparation for measures to flexibly restore heat removal functions under the assumption, that the seawater system and/or its functions were lost should be implemented.

(e) Ensuring the cooling of the spent fuel pool in an emergency

Measures to flexibly supply cooling water should be implemented when cooling the

spent fuel pool as well as when on-site water supply into the pool stopped.

- (f) Implementation of immediately necessary measures based on the structure, etc. of each site.

## (2) Confirmation, etc. by NISA

On May 6, 2011, NISA confirmed by on-site inspection, etc., that emergency safety measures have been appropriately implemented, except at Onagawa NPS, Fukushima Dai-ichi NPS and Dai-ni NPS.

On May 18, 2011, NISA received an implementation status report from Onagawa NPS, where work for taking measures against tsunami was delayed after suffering from the tsunami.

On April 21, 2011, implementation of emergency safety measures was directed to Fukushima Dai-ni NPS because it reached a stable status after cold shutdown. On May 20, 2011, NISA received a report on this implementation status. On-site Nuclear Safety Inspectors from NISA check whether supplies and equipment for emergency safety measures are deployed and such training is implemented. In the future, the inspectors will review the appropriateness and effectiveness, etc. of the content of the report and will strictly implement on-site inspections and review how supplies and equipment are deployed as well as how the implementation manual is developed.

## 2. Shutdown of Hamaoka NPS

In light of the accident at Fukushima Dai-ichi NPS, NISA directed on March 30, 2011, Chubu Electric Power Co., Inc. (Chubu Electric Power) and other electricity utilities, etc. to immediately work on emergency safety measures that would prevent reactor core damage etc., even if all three functions (all AC power supply, seawater cooling function and spent fuel pool cooling function) are lost due to a tsunami, and to promptly report the implementation status of these measures.

Following these instructions, Chubu Electric Power improved its operational safety programs and documented its procedure manual at Hamaoka NPS, installed the necessary equipment there and even adjusted its measures through drills. NISA performed an on-site inspection to

ascertain that these measures have been implemented appropriately and, as a result, evaluated on May 6 that appropriate measures are in place.

However, Hamaoka NPS is located close to the source area of the anticipated Tokai Earthquake, which is considered to be an extremely imminent danger as indicated by the evaluations of the Headquarters for Earthquake Research Promotion of the Ministry of Education, Culture, Sports, Science and Technology (MEXT), which anticipates an 87 percent probability of a magnitude 8-level earthquake occurring in the region within 30 years. Given the high possibility of Hamaoka NPS being hit by a major tsunami following this earthquake, NISA has requested Chubu Electric Power to surely put the plans stated in its report into practice, taking protective measures against tsunami, securing reserve seawater pumps and installing air-cooling type emergency generators, etc., and to shut down all the reactors at Hamaoka NPS until these measures are completed, as well as ascertained and evaluated by NISA.

On May 9, 2011, Chubu Electric Power announced its acceptance of this official request to shut down the Hamaoka NPS and submitted a report “Regarding Suspension of Operations at Hamaoka NPS” to the Minister of Economy, Trade and Industry. In response, the Ministry of Economy, Trade and Industry (METI) issued a ministerial statement on the same day to Chubu Electric Power. Accordingly, Chubu Electric Power decided to suspend resumption of operation of Unit 3 of Hamaoka NPS, and to shut down Unit 4 as of May 13, 2011 and Unit 5 as of May 14, 2011.