News Release

Ministry of Economy,
Trade and Industry (METI)

PRI-07-47

Press Release Information	Nuclear and Industrial Safety Agency (NISA), Ministry of Economy, Trade and Industry (METI)
Results of analyses of earthquake observation data obtained during "the Niigataken Chuetsu-oki Earthquake in 2007" at Kashiwazaki-Kariwa Nuclear Power Station, Tokyo Electric Power Company (Part 1).	

July 30, 2007
NISA/METI

Tokyo Electric Power Company has submitted the report (the first report) to NISA on response spectra and time-history acceleration wave-forms at the reactor building of Unit 1 to Unit 7 of Kashiwazaki-Kariwa Nuclear Power Station based on the observation record acquired during "the Niigataken Chuets-oki Earthquake in 2007" at Kashiwazaki-Kariwa Nuclear Power Station.

1. On the event of the earthquake, Units 2, 3, 4 and 7 of the nuclear power station automatically stopped by scram signal of "large earthquake acceleration". Units 1, 5 and 6 were not operating.
2. From the observation record released from Tokyo Electric Power Company on the day of the earthquake (July 16, 2007), it was identified that the maximum acceleration values by the earthquake observed at the basement of reactor building of Units 1, 5 and 6 have exceeded the assumed maximum response acceleration on the basement calculated with the seismic vibration used at the design stage.
3. NISA thus required Tokyo Electric Power Company to report the analyses of earthquake observation data and the seismic safety estimation of equipment important for safety (already reported on July 16,2007).
4. In response to the request、Tokyo Electric Power Company, on July 30, submitted to NISA the report (the first report) on the analyses of earthquake observation data obtained during the earthquake. The outline of the report is as shown in the attachment.
5. NISA will make a rigorous evaluation of the report by the help of the specialists.

Contacts:
Mr. Moriyama, Kawahara
Nuclear Power Licensing Division, NISA/METI
Phone: +81-3-3501-6289

Attachment

Summary Report (First Report) on the Analyses of the Earthquake Observation Data obtained at the Kashiwazaki-Kariwa Nuclear Power Station during the Niigataken Chuetsu-oki Earthquake in 2007

July 30, 2007

Tokyo Electric Power Company

TEPCO is analyzing the seismic data obtained during the Niigataken Chuetsu-oki Earthquake in 2007, based on the Direction Notice* received from the Ministry of Economy, Trade and Industry (METI)/ Nuclear and Industrial Safety Agency (NISA) on July 16, 2007. This is the first report describing the current status of data analysis, as the acquisition and compilation of all the data obtained during the main shock of the earthquake have been finished. Below is the summary of the report.

* the Direction Notice : Regarding the Analyses of the Earthquake Observation Data obtained at the Kashiwazaki-Kariwa Nuclear Power Station during the Niigataken Chuetsu-oki Earthquake in 2007 and the Evaluation of the Consequences to the Seismic Safety (NISA Document No.1 dated July 16, 2007)

1. Earthquake Observation at Kashiwazaki-Kariwa NPP

At Kashiwazaki-Kariwa NPP, 67 seismometers (seismic instrumentation) had originally been installed at different locations, including at reactor building and turbine building of Units 1, 5 and 6, as well as at the ground of the site (including the ground near the visitors' hall). In addition to these existing seismometers, 30 new seismometers have been were installed in April, 2007 at the reactor buildings and the turbine buildings of Units 1 through 7 as well as at the onsite earthquake observation stations. The former is called "existing seismometers" and the latter is called "new seismometers" in this report. Figure 1 shows the arrangement of the earthquake observation points.

2. Observation Records during the Niigataken Chuetsu-oki Earthquake

Figure 2-1 through 2-7 show the examples of the time histories of acceleration wave-form obtained during the main shock of the earthquake by the new seismometers on the reactor building basement (or basemat) of Units 1 through 7. Figure 3-1 through 3-7 show the examples of the comparisons between the floor response spectra based on the observation record and the calculated floor response spectra given by the seismic response analysis model with the vibratory ground motion data used at the design stage.

It was found that the vibratory ground motion wave-forms of the main shock had been lost for 63 seismometers out of the 67 existing ones following overwriting of the records of the aftershocks (as already reported on July 19th). It was also found that the records of main shock had been lost at a new seismometer installed at the 1st floor of the turbine building of Unit 3 due to the trouble of seismometer recording circuit.

However, we estimate that it is possible to perform detailed examination, because the peak acceleration values of main shock obtained by the existing seismometers are not lost, and also because the records of the main shock obtained by the new seismometers on the reactor building basement of each unit and on the turbine building basement of Unit 3.

3. Evaluation of the Consequence of the Earthquake to the Seismic Safety

3.1 Analysis of the Earthquake Observation Data obtained during the Earthquake

We will further continue to collect and compile earthquake observation data before analyzing them. The evaluations of vibratory grand motions will be performed for the confirmation of the seismic safety against the earthquake and for the imaginary free surface of the base stratum[1], which is analytically free form the effects of the upper ground.

In principle, the observation records on the building basement will be used to confirm the seismic safety against the earthquake.

As the method to evaluate the vibratory ground motion on the imaginary free surface of the base stratum, there are different records available: those of the reactor building basement, those of visitors' hall ground system and those of the aftershock. In evaluating these records, there are several reference values; the records of Units 1 and 5 ground bore hole systems (peak acceleration values) and records of Units 1 and 5 earthquake observation stations. In addition, the findings obtained during the Niigataken Chuetsu Earthquake in 2004 and the observation records around the NPP obtained by public agencies, will also be referenced.

3.2 Confirmation of Seismic Safety of the SSCs[2] important for Safety against the Earthquake

The seismic response analyses and the evaluation of seismic safety will be performed for the SSCs important for safety, using the vibratory ground motion to confirm the seismic safety against the earthquake.

4. Seismic Safety Evaluation to be performed

Items to be reflected to the future seismic safety evaluation and related seismic measures will be examined, based on the findings obtained from the earthquake such as the survey of active faults in the offshore area or the analyses of earthquake observation data.

---

[1] The imaginary free surface of the base stratum is a nearly flat surface of the base stratum extending over a considerable area, and above which neither surface layers nor structures are assumed to be present. The base stratum is firm bedrock which was formed in general in the Tertiary or earlier era and which is not significantly weathered.

[2] SSCs stands for systems, structures and components

(Note)

TEPCO will update the earthquake observation devises at the earliest possible time, considering the overwriting of the main shock records at 63 seismometers out of the 67 existing seismometers at the earthquake. As for the new seismometer, which had lost the main shock records, it will be repaired and replaced as soon as possible, though it now seems operating normally as the abnormal portion of the recording section is not used.

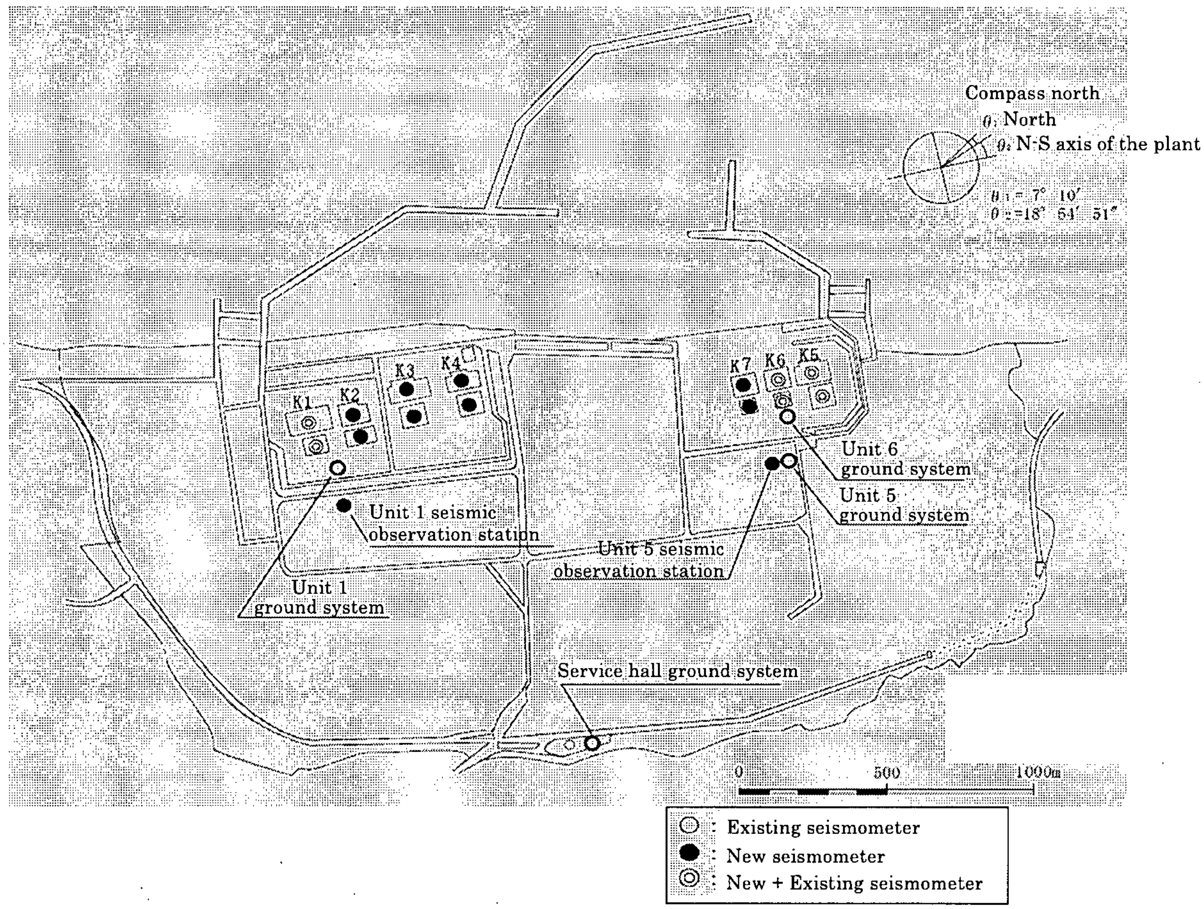

Fig. 1 Arrangement of seismometers at Kashiwazaki-Kariwa Nuclear Power Station

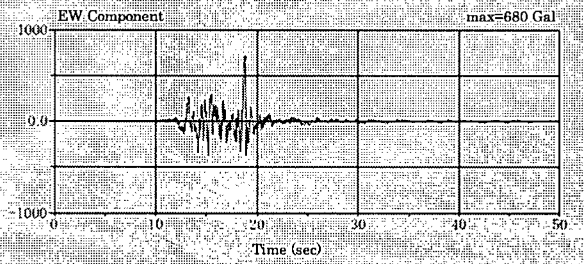

Fig.2-1 Acceleration over time on Unit 1 Reactor Building basement (East-West Direction)

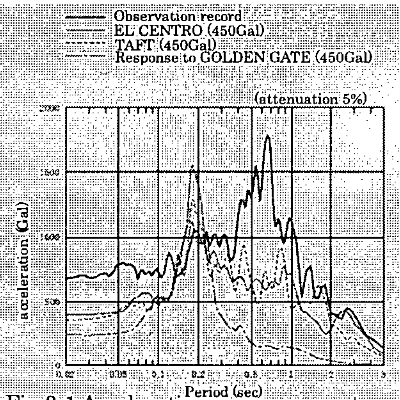

Fig.3-1 Acceleration response spectrum on Unit 1 Reactor Building basement (East-West Direction)

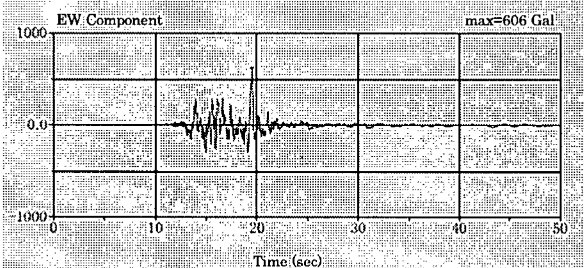

Fig.2-2 Acceleration over time on Unit 2 RB basement (E-W Direction)

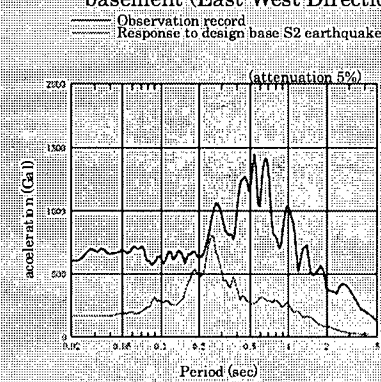

Fig.3-2 Acceleration response spectrum on Unit 2 RB basement (E-W Direction)

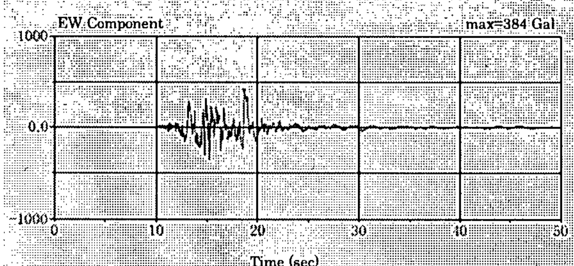

Fig.2-3 Acceleration over time on Unit 3 RB basement (E-W Direction)

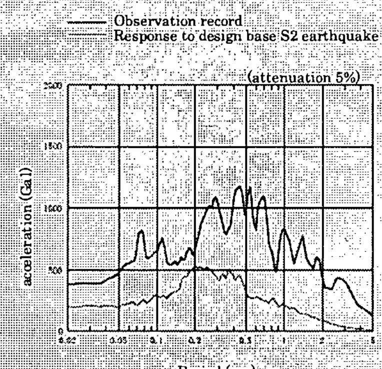

Fig.3-3 Acceleration response spectrum on Unit 3 RB basement (E-W Direction)

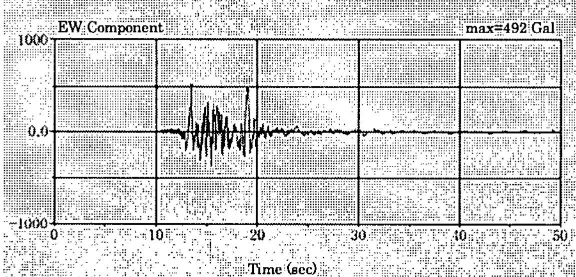

Fig.2-4 Acceleration over time on Unit 4 RB basement (E-W Direction)

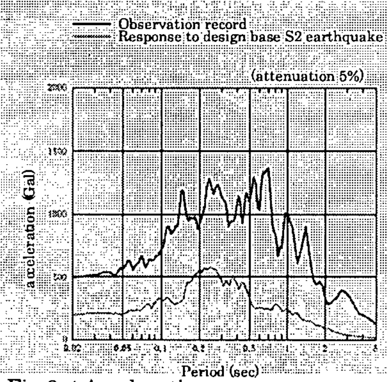

Fig.3-4 Acceleration response spectrum on Unit 4 RB basement (E-W Direction)

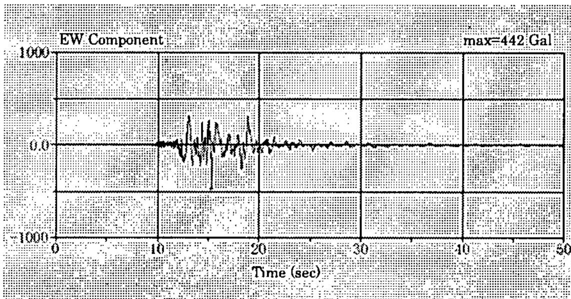

Fig.2-5 Acceleration over time on Unit 5 RB basement (E-W Direction)

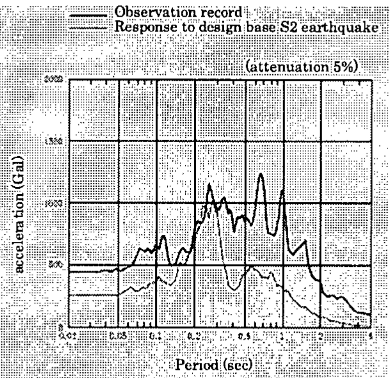

Fig.3-5 Acceleration response spectrum on Unit 5 RB basement (E-W Direction)

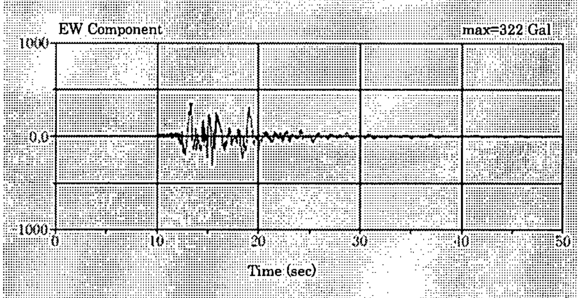

Fig.2-6 Acceleration over time on Unit 6 RB basement (E-W Direction)

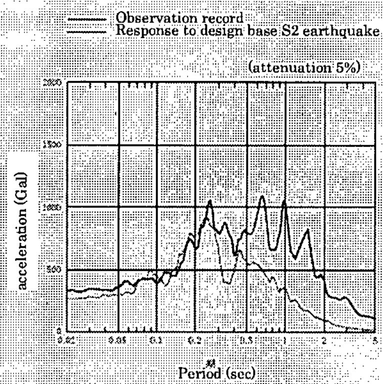

Fig.3-6 Acceleration response spectrum on Unit 6 RB basement (E-W Direction)

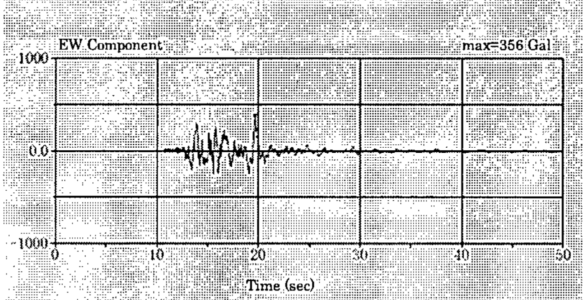

Fig.2-7 Acceleration over time on Unit 7 RB basement (E-W Direction)

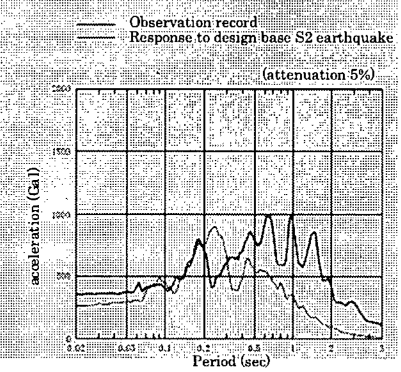

Fig.3-7 Acceleration response spectrum on Unit 7 RB basement (E-W Direction)