Appendix

Summary of the (First) Report on the Analysis of Observed Seismic Data Collected at Kashiwazaki-Kariwa Nuclear Power Station on the Occasion of the Niigata-Chuetsu-Oki Earthquake in 2007

In accordance with the Written Directives* received from the Nuclear and Industrial Safety Agency, the Ministry of Economy, Trade and Industry on July 16, 2007, The Tokyo Electric Power Company, Inc. (TEPCO) has since analyzed the observed seismic data collected at Kashiwazaki-Kariwa Nuclear Power Station on the day the Niigata-Chuetsu Off-Sore Earthquake (hereinafter referred to as "the Earthquake") occurred. We have completed the collection and compilation of all the records on seismic data observed when the Earthquake occurred, and submitted the Report on the Analysis of Observed Seismic Data to the Nuclear and Industrial Safety Agency, the Ministry of Economy, Trade and Industry on the 30th of July. The Report is summarized as follows:

* Written Directives

Analysis of Observed Seismic Data Collected at Kashiwazaki-Kariwa Nuclear Power Station on the Occasion of the Niigata-Chuetsu-Oki Earthquake in 2007, and the Impact Assessment of the Earthquake on Seismic Safety (July 16, 2007)

1. Seismic Observations made at Kashiwazaki-Kariwa Nuclear Power Station

At Kashiwazaki-Kariwa Nuclear Power Station, seismic observations have been made by a total of 67 seismometers installed in the reactor buildings, the turbine buildings and the site foundation of units 1, 5, and 6 (including the Service Hall). In April 2007, a total of 30 additional seismometers have been installed in the reactor buildings the turbine buildings and the seismic observation sheds on site of units 1 to 7. The former will be referred to as "the existing seismometers" and the latter as "the new seismometers". Figure 1 shows the distribution of the seismic observation points at the Kashiwazaki-Kariwa Nuclear Power Station.

2. Records of Observations made on the Occasion of the Niigata-Chuetsu-Oki Earthquake

Of the observation records collected when the Earthquake occurred, examples of acceleration time history waveforms provided by the new seismometers installed for the base mat of the reactor buildings of units 1 to 7 are shown in Figs. 2-1 to 2-7. Examples of comparison between floor response spectra based on observation records and those calculated using seismic motion inputs adopted for seismic response analysis models at the time of design are shown in Figs. 3-1 to 3-7.

It was revealed that waveform data of the main quake was lost for 63 of the 67 existing seismometers since the records for the main quake had been overwritten by those of the aftershocks (as notified on July 19). Also, records of the main quake collected by one of the new seismometer installed on the first floor of the unit 3 turbine building were lost due to an abnormal circuit in the recording unit of the seismometer.

However, we consider that sufficient reviews may be made of the main quake and aftershocks mainly because the maximum acceleration values recorded by the existing seismometers were not lost and that main quake data from the new seismometers installed on the base mat of the reactor buildings for each unit and on the base mat of the unit 3 turbine building were collected.

3. Impact Assessment of the Earthquake on Seismic Safety

3.1 Analysis of Observed Seismic Data Collected during the Earthquake

TEPCO will continue to collect and compile the records of aftershocks and evaluate the seismic motion to help facilitate verification of the seismic safety for this Earthquake as well as evaluate seismic motion for the open foundation surface of the site, in which the influences of the upper ground have been analytically removed.

In principle, the seismic observation data for the base mat of buildings will be used to verify seismic safety for this Earthquake.

Evaluation of the seismic motion for the open foundation surface may be conducted utilizing either; records collected from the base mat of reactor buildings, records collected from the foundation system of the Service Hall, or records of aftershocks. In conducting these evaluations, we will refer to the maximum

acceleration values collected from the foundation system for units 1 and 5, data collected from the seismic observation shed for units 1 and 5, as well as knowledge obtained from the year 2004 Niigata-Chuetsu Earthquake and observation records around the site by public agencies.

3.2 Verification of Seismic Safety for Safety Important Facilities

Seismic response analyses and seismic safety assessment will be conducted on safety important facilities using the seismic motion to verify their seismic safety.

4. Future Seismic Safety Verification

Based on information about the Earthquake that will be obtained through the surveys of active faults in sea areas and results from analyses of observed seismic data, we will consider future seismic safety verification and matters that should be reflected in seismic countermeasures to be taken.

[References]

We will renew our seismic instrumentation as soon as possible in light of the incident that 63 of the existing seismometers overwrote records of the main quake with those of the aftershocks. We will also repair or replace the new seismometer whose data for the main quake had been lost as soon as possible although it is currently operating normally by not using the defective part in the recording unit.

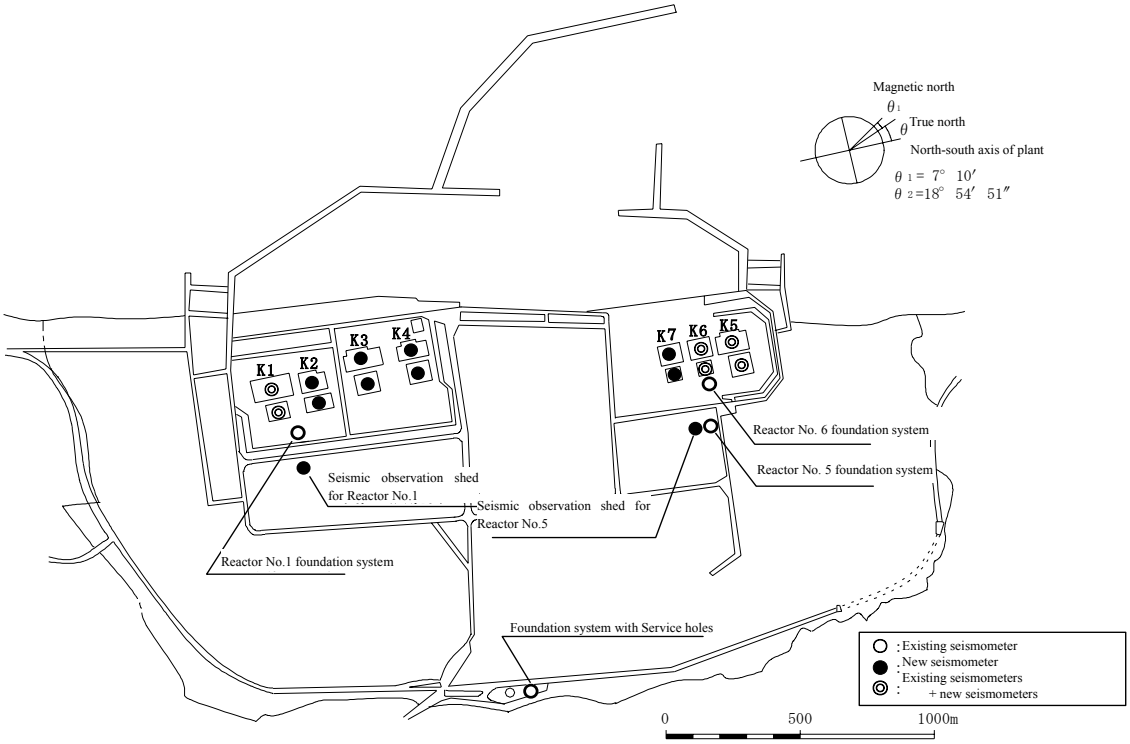

Fig. 1 Location of seismic observation points at Kashiwazaki-Kariwa Nuclear Power Station

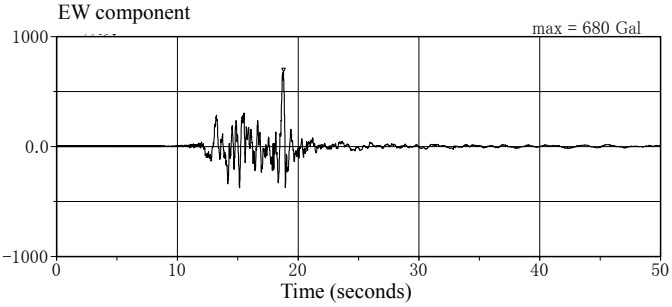

Fig. 2-1: Acceleration time history waveforms for the base mat of the unit 1 reactor building (East-west direction)

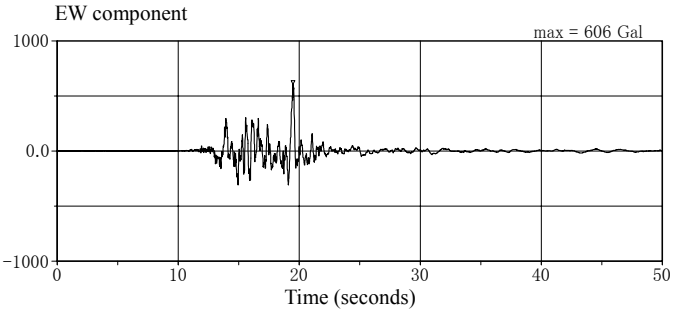

Fig. 2-2: Acceleration time history waveforms for the base mat of the unit 2 reactor building (East-west direction)

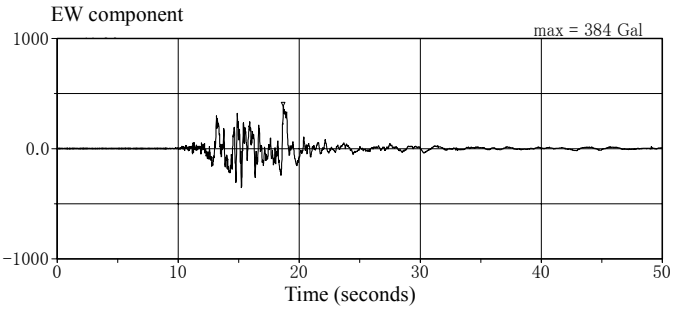

Fig. 2-3: Acceleration time history waveforms for the base mat of the unit 3 reactor building (East-west direction)

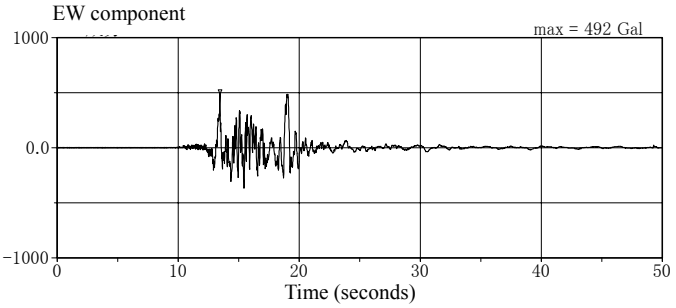

Fig. 2-4: Acceleration time history waveforms for the base mat of the unit 4 reactor building (East-west direction)

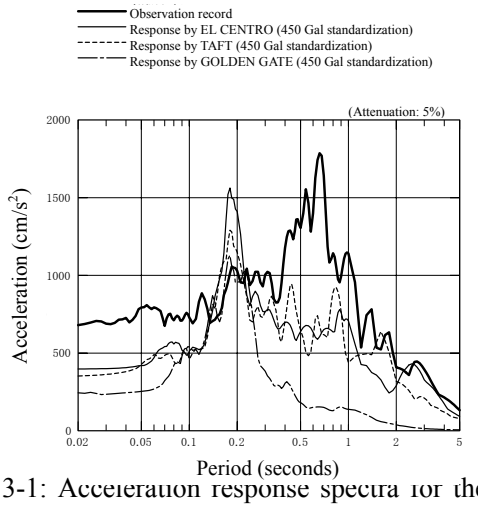

Fig. 3-1: Acceleration response spectra for the base mat of the unit 1 reactor building (East-west direction)

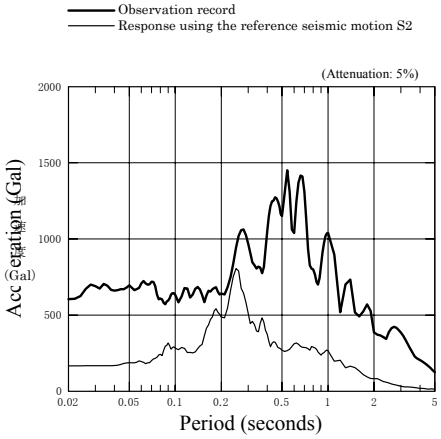

Fig. 3-2: Acceleration response spectra for the base mat of the unit 2 reactor building (East-west direction)

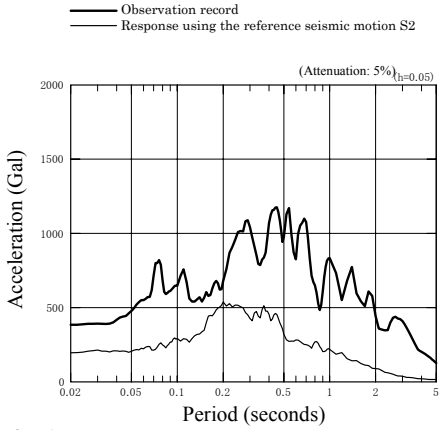

Fig. 3-3: Acceleration response spectra for the base mat of the unit 3 reactor building (East-west direction)

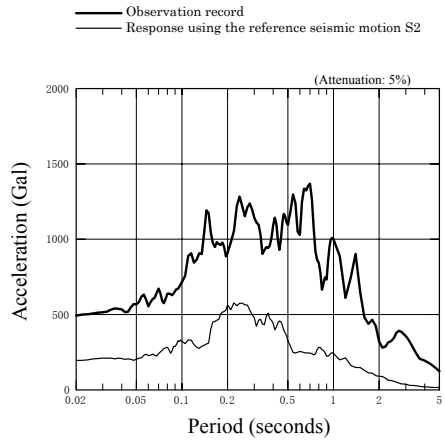

Fig. 3-4: Acceleration response spectra for the base mat of the unit 4 reactor building (East-west direction)

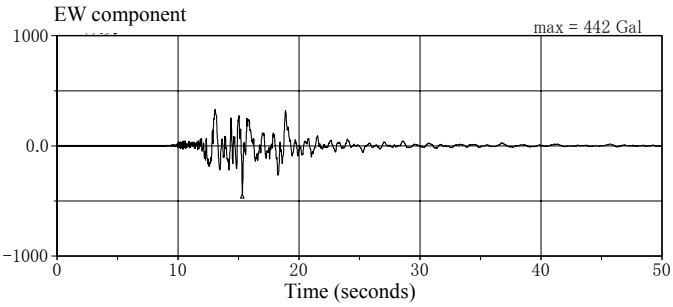

Fig. 2-5: Acceleration time history waveforms for the base mat of the unit 5 reactor building (East-west direction)

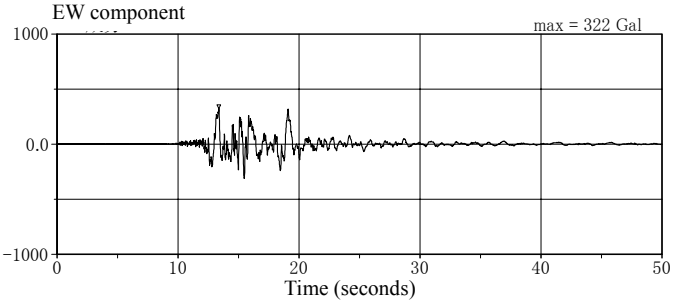

Fig. 2-6: Acceleration time history waveforms for the base mat of the unit 6 reactor building (East-west direction)

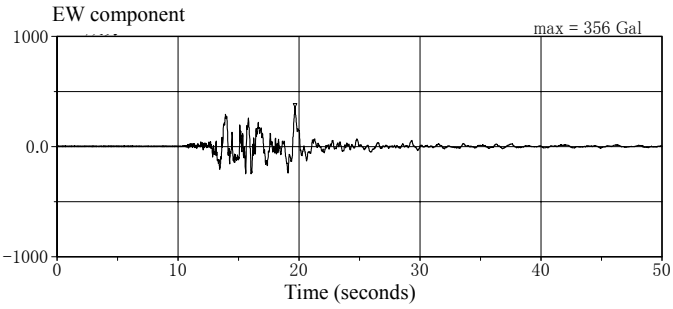

Fig. 2-7: Acceleration time history waveforms for the base mat of the unit 7 reactor building (East-west direction)

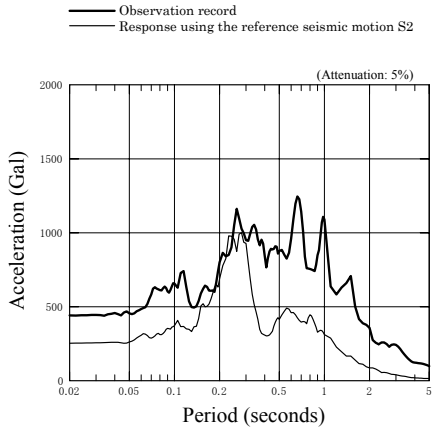

Fig. 3-5: Acceleration response spectra for the base mat of the unit 5 reactor building (East-west direction)

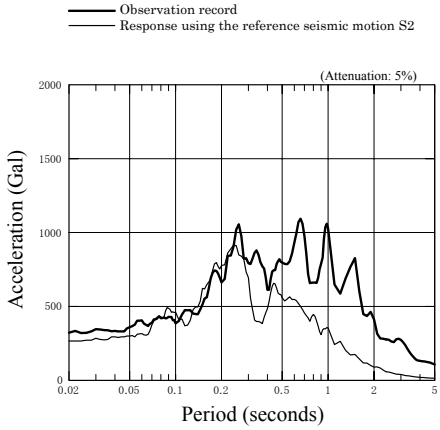

Fig. 3-6: Acceleration response spectra for the base mat of the unit 6 reactor building (East-west direction)

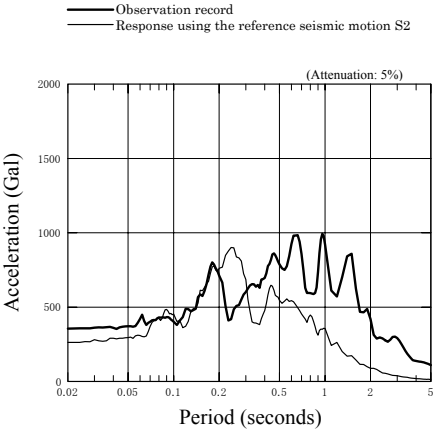

Fig. 3-7: Acceleration response spectra for the base mat of the unit 7 reactor building (East-west direction)