

## Strong ground motions during the 2007 Chuetsu-oki earthquake in Kashiwazaki-Kariwa NPP and identification of soil structures

# Koichiro Saguchi[1]; Susumu Kurahashi[2]; Kazuaki Masaki[3]; Kojiro Irikura[1]

[1] Aichi Inst. Tech.; [2] Production and Construction, Eng, AIT; [3] Dept. of Civil Engineering, Aichi Inst. of Tech.

Strong ground motions during the Niigataken Chuetsu-oki earthquake occurring on July 16, 2007, were observed in the Kashiwazaki Kariwa Nuclear Power Plant. The maximum acceleration of 993gal (the EW direction) at 255m deep (G10) below ground of No. 1 reactor was obtained during the main shock. The maximum acceleration of 450gal (the EW direction) in 312m (G55) below ground of No. 5 reactor was also obtained. However, there were obtained no time history records and only the maximum accelerations.

We identified the underground structural model from aftershock records obtained in the No. 1, No. 5 and Service hole arrays using the simulated annealing method (Ingber (1989)). Spectral ratios between surface and underground data of transverse component are used for the inversion in this study.

Based on numerical experiments it is indicated that S-wave velocities and Q values of individual layers are inverted very well. The simulated waveforms obtained from the one-dimensional multiple reflection method show good agreement with the observed seismograms in the borehole stations.

Strong motions on the ground surface in the No. 1 and No. 5 borehole arrays during the main shock are simulated from the observation records on the base mat in the reactor buildings of No. 1 and No. 5 using the one-dimensional multiple reflection method with estimated underground structures.

Finally, ground motions of underground observation sites (G10 and G55) in the No. 1 and No. 5 borehole arrays during the main shock are simulated from the calculated records on the ground surface by the same procedure as mentioned above. The results indicate that the maximum accelerations in simulated waveforms are similar to the observed values.