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Evaluation of faults in the site of power plants and stress analyses

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The expert meeting on the investigation of fracture zones in the site of the Ohi power station of NRA (Nuclear Regulation Autority) concluded that the F-6 fault in the site is not an active fault. Stress tensor inversion was a key technique to make the conclusion during the discussion. In this talk, I will explain how stress tensor inversion was used to evaluate the faults.

It is difficult to evaluate faults based on paleoseismological techniques in the site of many of the power plants, due to the lack of young sediments and tectonic landforms. For the evaluation of the safty of the power plants, it is important to evaluate if the faults in the site are active. Degree of the activity of the faults is not always important. Stress tensor inversion based on the fault slip data is useful because the phenomenon is relatively clear.

There are two concepts to evaluate if the faults are active or not using stress analyses. One is to compare the structures in the fault with the present stress such as slip tendency. The other is that stress tensor inversion is used as a tool to construct the tectonic histories. The former concept may have a problem concerning the stability of stress, especially after large earthquakes. The later concept used stress tensor inversion to determine the sequence of tectonic stages. Tectonic stage is the period during which faults had repeated to move due to the control of similar stress condition. Once the structures in faults at different places were identified to be controlled by the same stress condition, those structures were formed during the same tectonic stage. The comparison of the result of this analysis with the result of fault trenching enables us to evaluate if the faults are active or not.

Keywords: power plant, fracture zones in the site, stress tensor inversion, tectonic stage