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Selection of scenario earthquakes based on the national seismic hazard maps for Japan

Nobusuke Hasegawa[1*], Hiroyuki Fujiwara[1], Shin-ichi Kawai[1], Nobuyuki Morikawa[1], Yasushi Komaru[2]

[1]NIED, [2]OYO RMS

The seismic damage assessment is a basic document of earthquake disaster prevention measures, and the selection of the scenario earthquake is an important problem to examine earthquake disaster prevention measures. The scenario earthquake is selected by seismic activity in an object area and the circumference, and by the degree of the effect on the object area. But, the judgment reason has left the considerable ambiguity. In late years, seismic hazard map covering all over Japan (the national seismic hazard maps for Japan) is announced by the Headquarters for Earthquake Research Promotion. The national seismic hazard maps of Japan consists of ”probabilistic seismic hazard maps” and ”scenario earthquake shaking maps”. In addition, the earthquakes are classified in three earthquake categories according to the characteristic. By utilizing this information, it can be expected that the rational selection of the scenario earthquake becomes possible. Then, in this study, for the purpose of supporting seismic damage assessment of local government, it was examined the selection method of the scenario earthquake by considering seismic risk based on the national seismic hazard map for Japan, it was examined.

In this study, the earthquake which affect the object area considering seismic risk estimated by simple technique, was classified into the earthquake which should have dealt right now, the earthquake which should prepare for, and the earthquake which did not need to prepare for now. In addition, the earthquakes that should prepare for were classified in the large-scale damage and the middle scale damage. This is so that demanded disaster prevention measures are different from the large-scale damage (a wide area and the serious damage) in the middle scale damage (the damage to be concentrated in the weak area). And, the damage forms are different by the earthquake characteristics (occurrence frequency, spectrum and duration of ground motion). According to the earthquake category used with the national seismic hazard map for Japan, the classification mentioned above was applied. In the Fujisawa City that carries out the cooperative research with National Research Institute for Earth Science and Disaster Prevention (NIED), the earthquake was classified using seismic activity model of national seismic hazard maps.

The future problem is to determine the procedure of parameter setting for strong ground motion for the selected scenario earthquake. Especially, the quantification of the indeterminateness in strong motion prediction recipe, and the standardization of the procedure of the parameter setting based on quantified indeterminateness are problems. The selecting method of the scenario earthquake is a decision-making problem, and cooperation with the decision-maker is indispensable. Therefore, the research will be advanced on selecting method of the scenario earthquake through the cooperative research with the Fujisawa City.

Keywords: seicmic hazard map, selecting method of scenario earthquake, earthquake risk, earthquake category