Current Regulatory Earthquake Zoning Map of Turkey

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Abstract

Preparation of latest version of the regulatory earthquake zoning map of Turkey, which was one of the activities in the National Plan of Turkey for International Decade for Natural Disaster Reduction (IDNDR) period (1990-2000), was achieved by Earthquake Research Department at General Directorate of Disaster Affairs in cooperation with Earthquake Engineering Research Center at Middle East Technical University.

Different from the previous earthquake zoning maps of Turkey which were prepared based on deterministic procedures, the current map was prepared based on the peak ground acceleration (PGA) contour map that was constructed by Gülkan et al. (1993) using probabilistic seismic hazard analysis methodology for a return period of 475 years. After the seismicity, fault zones and neotectonics of Turkey were reviewed in detail, 17 main seismic source zones were defined. In addition, background seismic sources were defined in order to take account of seismic activity that could not be related with any one of the main seismic sources. All seismic sources were modeled as area sources with exponentially distributed magnitudes and Poisson model was used to predict probabilities of occurrence of earthquakes in these sources. When the study was conducted, the existing strong motion records were not adequate to develop a local attenuation relationship for Turkey. Therefore, attenuation expression developed by Joyner and Boore (1981) from western U.S. ground motion data was used. Seismic hazard analyses were performed according to combinations of different assumptions made with respect to uncertainty in source boundaries, seismicity parameters and attenuation characteristics of the ground motion; and the results were combined by utilizing the theorem of total probability within the framework of logic tree methodology. Based on the estimated PGA values, Turkey was divided into five earthquake zones. Consequently, current regulatory earthquake zoning map of Turkey was published and became effective in 1996.

REFERENCES:

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