OPTIMAL EARTHQUAKE PROTECTION SYSTEM WHEN SEISMOLOGICAL INFORMATION IS INCOMPLETE OR/AND UNCERTAIN;

by

Eisenberg J.M.[I]

Safety problems together with those of optimum design of seismic protective systems in conditions of uncertain or/and incomplete information as to spectra and other earthquake ground motion parameters are analysed [1,2].

One of the results of the research consists in the following. When at a given site there is a possibility of dynamic (earthquake,wind) effects, different in dominant frequencies and in other spectrum characteristics, it is possible to considerably reduce seismic loads and to approach the optimum solution by means of the use of systems possessing dynamic characteristics variable within a controlled range (structurally variable). These systems are in the sense adaptable to seismic effects. Principally the same situation occurs where the ground notion parameters are uncertain.

A method of the parameters change by the use of structures with reserve elements,capable of disengaging at certain seismic ground motions, is suggested.

Mathematical models of earthquake ground motion as a set of narrow-band random processes and a brand process of a white noise type are presented. The problem is analysed as consistently probabilistic. A random process shoot theory is employed. Some experimental results concerning disengaging elements structures behaviour are considered.

The research results indicate the effectiveness of the reorganizing earthquake seismic protective systems with reserve elements at any models of seismic effects and with the account, paralled with a seismic load or a wind load (which does not coincide in time with a seismic one).

Quantitative characteristics of reserve of systems effectiveness depend essentially on the type of the effect.

Bibliography.

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I D.Sci., Head of Research Laboratory of Structural Earthquake Resistance,Central Research Institute For Building Structures, Gosstroy, Moscow, 1976.