

# SOCIAL AND ECONOMIC ASPECTS OF SEISMIC RISK

Janez Lapajne

## ABSTRACT

An attempt has been made to outline some general procedures for risk management and for the assessment of an acceptable risk level, taking into account scientific, engineering, economic, social and political aspects. The proposed method relies on accepted definitions of seismic hazard, vulnerability and risk. The procedure is first of all meant for the earthquake resistant design of capital engineering structures, like dams and nuclear power plants, but can be adapted also for physical planning and other purposes.

## Introduction

Increasing technological complexity of engineering structures incorporated in a sensitive socioeconomic environment calls for rational evaluation of earthquake or seismic risk. The most important and most crucial result of seismic risk analysis is the determination of the acceptable risk for the purpose of earthquake resistant design.

There is no unique procedure for the estimation of seismic risk. In the narrower sense, the object of seismic risk analysis is to describe the nature of possible future ground shaking, that is to assess the seismic hazard. This is actually only the first stage of seismic risk assessment, nevertheless, it is often the only one.

In order to assess the seismic risk, in addition to the information on seismic hazard, data on elements at risk and their vulnerability are required. Once all this information has been prepared, the determination of the acceptable risk is chiefly an economic, social, and political subject. Concerning the economic part of the problem, an appropriate optimization technique would be highly desirable.

## Seismic Hazard, Vulnerability and Risk

In engineering seismology and earthquake engineering literature, there is, or at least has been in general, ambiguity regarding the use of some terms. In order to avoid misunderstanding, definitions of terms