



Pore-water pressure measurements during earthquakes – the study of triggering conditions of soil liquefaction at a site.

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Liquefaction is one of the most important, interesting, complex and controversial earthquake engineering topics. Its devastating effects were brought in attention especially since the Niigata earthquake in 1964 ($M_s=7.5$). In the elapsed 40 years, different terminologies, procedures and methods of analyses have been proposed, to understand the liquefaction-related soil behavior, the triggering mechanism and the manner in which they contribute to earthquake damage. Three critical aspects of liquefaction hazard evaluation at a site must be studied: susceptibility of soil, initiation and effects. The fact that a soil layer at a site is susceptible to liquefaction does not mean that liquefaction will necessarily occur at a given earthquake. Its occurrence requires a disturbance that is strong enough to initiate, or trigger it. It is known that the key to the initiation of liquefaction is the generation of excess pore pressure during an earthquake. Without changes in pore pressure, hence changes in effective stress, no effects of liquefaction can occur. Therefore, the measurement of pore water pressure during earthquakes in liquefaction-susceptible layers at a site, will allow necessary insights in the triggering mechanism of liquefaction, concerning correlations between liquefaction-susceptible soil-behavior (state parameter) and the characteristics of the earthquake loading, mainly the amplitude and duration, depending themselves on the local magnitude and epicentral distance at a site. Favorable conditions to study these correlations and their influence upon the triggering mechanism at earthquakes are offered in Bucharest, Romania, hit frequently by Vrancea-earthquakes. The study was made possible through the funding by the German Research Foundation (Deutsche Forschungsgemeinschaft) and is carried out within the Collaborative Research Center

(CRC) 461: “Strong Earthquakes: A Challenge for Geosciences and Civil Engineering”, by the University of Karlsruhe, Germany, together with the Romanian Group of Strong Vrancea Earthquakes.