



## **0.1 Probabilistic Seismic Hazard Assessment in Romania used for dam's rating in seismic risk classes**

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The main goal of this paper is the probabilistic assessment of the seismic hazard and the rating of all dams from Romania into seismic risk classes. Dam owners and regulators must ensure that dams are safely operated and present no risk to the public in case of an earthquake. While most old or new dams in recognized seismic regions have been evaluated and analyzed for seismic loads, dams located in areas of moderate or infrequent seismicity have been given less systematic attention. In such cases, owners of many dams or officials in charge of dam safety programs may consider comparative assessment of the seismic risk associated with their dams and establish priorities, as needed. Risk classes can be used to establish the necessity of detailed assessment of seismic safety of the dams and to establish the priorities of these evaluations.

Methodology which is used in this paper offers an easy way to evaluate the most vulnerable hydrotechnical facilities among the multitude of the Romanian dams, that are affected by normal and intermediate-depth Vrancea earthquakes and the crustal areas from Romania: Banat and Danubian zones, Crisana-Maramures, Transilvanian Depression, Western Muntenia, Eastern Muntenia, Predobrogean Depression, Barlad Depression and Vrancea crustal seismic zone and the seismic zones from Bulgaria and Serbia situated in the vicinity of the Romanian border .

The risk is expressed as a product between hazard and vulnerability. In particular,

seismic risk in the case of hydrotechnical arrangements is computed as a product between seismic hazard (corresponding to the location of the respective hydrotechnical arrangement) and the seismic vulnerability of the respective arrangement. Various risk factors and weighting points can be used to approximately quantify the Total Risk Factor (TRF) of any dam [Bureau and Ballentine, 2002]. The TRF depends on the dam type, age, size, the downstream risk potential, and the dam vulnerability, which depends on the seismic hazard of the site. The dam structure influence is represented by the sum of capacity, height, and age risk factors. The downstream hazard factor is based on population and property at risk.

The most important step in this analysis remains the assessment of the seismic hazard around Romania, taking into account all the seismogenic sources.