



Forecasting scenarios validation – case study for the city of Plovdiv and Ruse

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Generation of earthquake scenarios is the main step in the process of loss estimates and which is more important – in their prevention. The territory of Bulgaria (situated in the eastern part of the Balkan Peninsula) represents a typical example of high seismic risk area. Over the centuries, Bulgaria has experienced strong earthquakes.

The first consideration in this work is weather comparison between calculated and observed intensity values are meaningful and if they can be used to “validate” forecasting scenario. To make this test scenarios for Plovdiv and Ruse are generated and the obtained intensity values are compared to the observed data from real earthquakes.

Plovdiv and Ruse are two of the largest cities of Bulgaria. Their territories are characterized with high risk exposure, both in terms of cultural heritage and of industrial facilities.

Plovdiv is the second-largest city in Bulgaria with a population of about 400 000. It is situated in the southern part of the country on the banks of the Maritsa River. History of the city of Plovdiv spans some 6000 years, with traces of a Neolithic settlement dating to roughly 4000 BC. Over the past century, the city of Plovdiv has experienced several strong earthquakes. The earthquakes that mainly influence the hazard for Plovdiv originate near the city. The intensity assessments used for verification are from the 1928 earthquakes (on April 14th, $M=6.8$ and the earthquake on April 18th, 1928, $M=7.0$). Distribution of macroseismic effects along the city is estimated on the base of a large number of available observations and documented damages.

Ruse is the fifth-largest city in Bulgaria, with a population of near 170 000. Ruse is situated in the northeastern part of the country, on the right bank of the Danube. The city is known for its 19-20th-century Neo-Baroque and Neo-Rococo architecture and now is an administrative, transport and tourism center of Bulgaria.

Seismic history of Ruse shows that the hazard for the city is mainly influenced by the intermediate quakes occurred in the region of Vrancea (Romania) at a distance of more than 200 km from the city. The intensity assessment are from the two of the strongest past earthquakes (the 1940 quake, $M=7.3$ and the 1977 quake, $M=7.2$, both occurred in Vrancea, Romania) affected the city.