

## VULNERABILITY TO EARTHQUAKES IN UKRAINE

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### ABSTRACT

Major part of the Ukraine territory is disposed on stable East European Platform and till recently was considered as aseismic one. Two zones of high seismicity are the Alpine orogens: Crimea and Ukrainian East Carpathians. In Crimea, 11.09.1927 Yalta destructive earthquake (EQ) of magnitude (M) 6.8 and intensity I=8 occurred in and around Yalta town, in 1471 EQ of I=9 took place. In antique times, several Greek towns have been destroyed by EQs in Crimea. In Ukrainian East Carpathians EQs' magnitude do not exceed 5.

100-180 km deep EQs in Vranča area of Carpathians (Romania) create regional seismic risk for considerable part of Ukraine with lines of equal intensity elongated in NE direction, i.e. to Kiev and Moscow. Case studies of 30.08.1986 (M=6.9), 4.03.1977 (M=7.2), 10.11.1940 (M=7.25) and stronger, destructive in Ukraine, EQs of 26.10.1802, 1.10.1446 and 1230 will be reviewed.

In the East European Platform, EQs of small magnitude (1.5-3.5) but locally sometimes destructive (I=6-7) were observed: 1873 (I=7) near Uman town, 1875 and 1937 (I=6) in Mosti, 1976 (I=6) in Dolina, 26.04.1986 in Chernobyl (M=1.4, I=3-4), which occurred just 16 s before 4<sup>th</sup> unit of Chernobyl Nuclear Power Plant (NPP) explosion. Seismic vibrations apparently produced a disturbance in technological processes in the nuclear reactor and stimulated the Chernobyl catastrophe (Geophys.J., v.19, N3, 3-15, 1997). EQs, both remote from Vranča area and local, can stimulate landslides, destruction of dams (including the dams of artificial "seas" along highly populated Dnieper river), mines, NPP, chemical factories and other dangerous objects of industrialization.

Strong efforts of scientists and society are needed to reduce seismic risk in Ukraine. The first success we have had in 1989, when after extensive study of historical EQs, geodynamic and geological evidence, the maximal expected EQ intensity in Kazantip area, Crimea, was re-estimated from 6 to 9. This re-estimation resulted in cancellation of Crimean NPP construction (after 10 years of its building). Taking into account poor economic situation in Ukraine nowadays, effective efforts in seismic risk mitigation can be developed in close cooperation (both methodological and financial) with European Union.