Geophysical Research Abstracts
Vol. 14, EGU2012-14403, 2012
EGU General Assembly 2012

Damage to industry and utilities during the October (Mw=7.2) and November(M=5.6), Van Lake Earthquakes, Eastern Turkey

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On October 2011, an earthquake of magnitude, Mw=7.2 hit the province of Van causing a total of 70 multistory buildings to collapse and 600 fatalities. The earthquake was associated with a reverse faulting mechanism and the epicenter was nearly 30 km to the north of the city. Building damage was much more localized in the town of Ercis, which was nearly 60 km to the north of Van. Whereas, most of the industrial and utility damages happened around the industrial zone of Van and Ercis.
Two weeks after the main shock, another moderate earthquake (strike slip) hit the southern Van, causing appreciable amounts of additional damage in the Van city. Despite its magnitude, its effects on the water and electric utilities was in appreciable amounts.
This paper provides a brief overview of these damages as well as the results of the field observations. Pipe damages due to soil failure (liquefaction inducted lateral spreadings) and transient (wave passage) waves are quantified. Comparisons are given for the estimated vs. observed repair rates. Results reveal that the code based repair rates for buried segmented pipes were compatible with the observations.