

Further Development in Predicting Post-Earthquake Fire Ignition Hazard

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Abstract : In nearly all earthquakes of the past century that resulted in moderate to significant damage, the occurrence of postearthquake fire ignition (PEFI) has imposed a serious hazard and caused severe damage, especially in urban areas. In order to reduce the loss of life and property caused by post-earthquake fires, there is a crucial need for predictive models to estimate the PEFI risk. The parameters affecting PEFI risk can be categorized as: 1) factors influencing fire ignition in normal (non-earthquake) condition, including floor area, building category, ignitability, type of appliance, and prevention devices, and 2) earthquake related factors contributing to the PEFI risk, including building vulnerability and earthquake characteristics such as intensity, peak ground acceleration, and peak ground velocity. State-of-the-art statistical PEFI risk models are solely based on limited available earthquake data, and therefore they cannot predict the PEFI risk for areas with insufficient earthquake records since such records are needed in estimating the PEFI model parameters. In this paper, the correlation between normal condition ignition risk, peak ground acceleration, and PEFI risk is examined in an effort to offer a means for predicting post-earthquake ignition events. An illustrative example is presented to demonstrate how such correlation can be employed in a seismic area to predict PEFI hazard.

Keywords : fire risk, post-earthquake fire ignition (PEFI), risk management, seismicity

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