## A novel approach for assessment on the wind-induced fragility of transmission tower

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## ABSTRACT

As a part of critical infrastructure, the overhead high-voltage transmission line system is a typical wind-sensitive structure featured with long-span geometric nonlinearity conductors and high-rise flexible tower. In this paper, a novel approach is proposed to address wind-induced fragility of a tower under wind hazards, considering the stationary dynamic wind load effect by the equivalent static wind load (ESWL) distribution, as well as the uncertainty of the Yang's model and strength of the material properties of the main columns members in structural material properties of the tower. The nonlinear geometric and elastic-plastic static push-over analysis (NSPA) with the initial geometric defects is applied to estimate the wind-resistance performance of the tower structure, and were quantified by energy equivalent method to three damage levels: slight, severe and collapse. Then the fragility curves for the three performance levels of the tower are evaluated.

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