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Evaluation of Progressive Collapse of Transmission Tower

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Abstract : The transmission tower is one of the crucial lifeline structures in a modern society, and it needs to be protected against extreme loading conditions. However, the transmission tower is a very complex structure and, therefore, it is very difficult to simulate the actual damage and the collapse behavior of the tower structure. In this study, the actual collapse behavior of the transmission tower due to lateral loading conditions such as wind load is evaluated through the computational simulation. For that, a progressive collapse procedure is applied to the simulation. In this procedure, after running the simulation, if a member of the tower structure fails, the failed member is removed and the simulation run again. The 154kV transmission tower is selected for this study. The simulation is performed by nonlinear static analysis procedure, namely pushover analysis, using OpenSEES, an earthquake simulation platform. Three-dimensional finite element models of those towers are developed.

Keywords : transmission tower, OpenSEES, pushover, progressive collapse
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