

## Experimental investigation of failure modes of transmission towers

Pyounghwa Kim<sup>1)</sup>, Whi Seok Han<sup>2)</sup>, Jeong Hun Kim<sup>3)</sup>, Young Kyu Ju<sup>4)</sup>,  
Young Jong Kang<sup>5)</sup>, and Seungjun Kim<sup>\*,6)</sup>

1), 2), 4), 5), 6) *School of Civil, Environmental and Architectural Engineering, Korea University, Seoul 02841, Korea*

6) [rocksmell@korea.ac.kr](mailto:rocksmell@korea.ac.kr)

3) *Next Generation Transmission & Substation Lab., KEPCO Research Institute, Daejeon 34056, Korea*

### ABSTRACT

This paper presents an experimental investigation into the failure modes of large-scale transmission towers. We designed and fabricated four different types of transmission towers based on a newly suggested LRFD-based design code. First, we evaluated the ultimate load-carrying capacities of the towers and compared them to results from nonlinear analysis. By applying design load combinations, we measured structural stresses in the main posts and bracing, as well as displacements. The experimental results indicate that towers with main posts made of angle members exhibit inelastic buckling, whereas those with main posts made of hollow section pipes exhibit yielding at the sections. Detailed findings will be discussed in this conference session.

### REFERENCES

Kim P, Han WS, Kim JH, Lee J, Kang YJ, Kim S. (2023). "Analytical investigation of the effects of secondary structural members on the structural behaviors of transmission towers", *Buildings*. **13**(1), 223.

---

1) Research Professor

2) Doctoral Student

3) Senior Researcher

4) Professor

5) Professor

6) Associate Professor