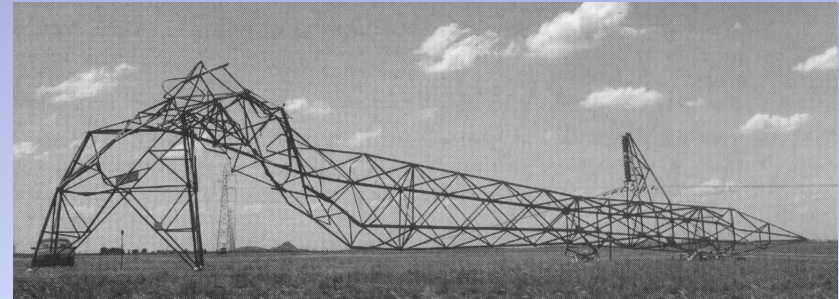


AEROELASTIC MODELLING OF TRANSMISSION LINES UNDER DOWNBURST OUTFLOW WIND LOADING

Background

Continued wind damage to transmission lines during storms provides the motivation for a wind tunnel study of this type of structure.

An aeroelastic study examines the motion of a line section when subjected to wind forces. The wind loading will be based on the drag coefficients found by Mara (2007) for a static tower model.



*Tower failure in Bendigo, Australia
(Holmes 2001)*

Objective

- Design of an aeroelastic model of a guyed tower and conductor span.
- Wind tunnel testing of the model in a plane wall jet flow.

Research To Be Carried Out

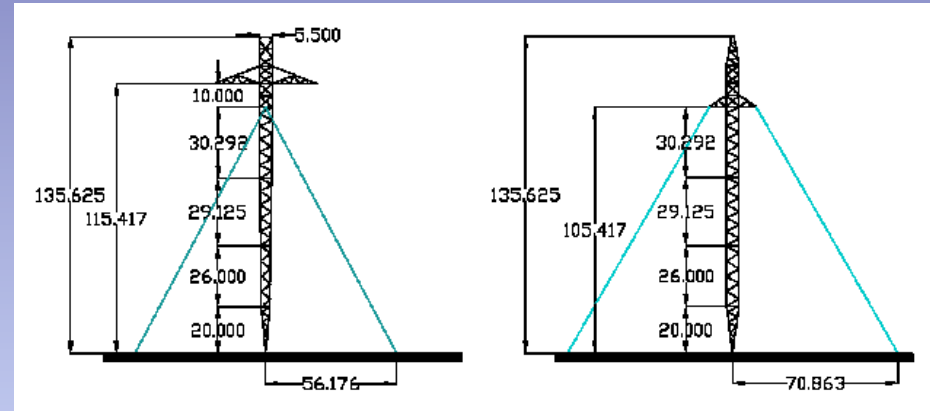
Design of a model to meet the following conditions:

Similarity of

- geometry (conductor sag and span)
- mass ratio (inertia of the flow and structure)
- reduced frequency (modes of vibration)

Modelling of

- drag force
- aerodynamic damping
- axial force



Elevation views of the full-scale guyed tower

Key Findings

The main challenges are

- meeting the material properties required for the reduced scale model, as dictated by the scaling
- determining the level of structural detail that needs to be included in the model