Executive Summary

In South Australia, steel is the most important and common material used for stobie poles. However, the steel beam exposed to the outside is prone to corrosion, which can greatly reduce its lifespan.

Experimental tests have already been conducted on materials that can replace the steel of stobie pole. However, experimental testing is a time-consuming and expensive process, especially to investigate the various properties, sizes, and effects of material parameters.

Therefore, the research objective of this project is to prove its validation of the results from the experimental test by simulating the behaviour of the stobie pole models using the finite element method (FEM). This can overcome disadvantages (cost and time consumption) related to the experimental test.

ABAQUS software was used to model the nonlinear behaviour of composite materials and materials such as stobie poles using nonlinear FEM. The specimens in the experimental test were modelled under the same conditions and the results were compared.

As a result, the error range of the stiffness was between about 10-20% and the overall average was approximately 16%. Validation of modelling can be confirmed through the normal distribution and standard deviation of errors. The standard deviation of the weak axis was confirmed to be 5.89, and the standard deviation of the strong axis was 2.18.