

1.5 MW WIND TOWER FATIGUE ANALYSIS

PURPOSE: To determine maximum fatigue life of critical component of wind generator supporter tower

HLA was responsible for determining the fatigue life of a critical component of a wind turbine support tower. The tower was 216 feet high, supporting a power generator and blade assembly weighing approximately 150,000 lbs. For personnel access, a doorway was placed at the bottom of the structure, in the region of highest loads. It was required to determine the fatigue life of the existing design, then propose alternate designs to increase the fatigue life. HLA created a detailed solid finite element model of the doorway, and inserted it into a model of the entire tower. Throughout the analysis process, HLA was able to make design changes that increased the fatigue life of the tower threefold.

- Large deflection
- Plasticity
- Wind loads
- Stress analysis
- Buckling calculation
- Fatigue life prediction

