

DOE Request for Information  
from Western Area Power Administration  
Resilience Against Severe Weather Events  
August 2019

Western Area Power Administration (WAPA) is a power marketing administration within the Department of Energy that markets and transmits wholesale electrical power across 15 states through an integrated 17,000-plus circuit-mile, high-voltage transmission system.

WAPA designs its substations and transmission lines to meet international standards and North American utility practices.

WAPA follows the following codes and standards when designing structures, foundations, and buildings.

1. American National Standards Institute (ANSI)
2. Institute of Electrical and Electronics Engineers (IEEE)
3. National Electrical Safety Code (NESC)
  - a. Basic wind speed, gusts, ice, rime, high intensity wind
  - b. Light, Medium, Heavy areas
4. American Society of Civil Engineers/ Structural Engineering Institute (ASCE/SEI) Manual No. 113
5. California General Order 95 (GO 95)
6. International Building Code (IBC)

Any areas that have the potential for extreme weather such as tornadoes are typically covered under NESC or ASCE. Following tornado damage, WAPA has replaced damaged or failing lattice towers with heavy duty steel poles.

To avoid cascading suspension structures, WAPA installs a tension structure every three miles or less to eliminate suspension structures from cascading for longer than three mile distances under heavy ice and wind loads. WAPA applies this practice to wood pole designs.

For substations, the NESC (beginning with the 2007 edition) includes extreme wind and ice loading in response to severe storm damage. It applies to structures over 60 feet in height, which typically affects 345kV and above substation design. WAPA's bus work, regardless of voltage, is not designed to the extreme ice/wind loading cases.

For substations prone to flooding, WAPA has raised the electrical equipment in the yard and placed the control building on piers to raise it above ground.