



Zone 5 – 2026 study results

Refer to Table ZS-4 and Figure ZS-20

Summary of key findings

- Heavy load growth in Waukesha and Washington counties will require voltage and load support. A new 345-kV line from Rockdale to Mill Road (formerly Lannon Junction) is one option being considered but not yet proposed to solve these problems,
- The Oak Creek-Pennsylvania 138-kV line uprate in-service date was determined considering not only the need date identified in the 2011 10-Year Assessment, but also the need dates identified in both the 2010 and 2009 Assessments. Therefore, the 2011 in-service date precedes the 2011 Assessment need date as described below, and
- Voltage and thermal issues remain in Zone 5 under contingency conditions.

The Brookdale East 138-kV bus, Allerton 138-kV bus and Bluemound 230-kV buses experience marginal bus voltage under NERC Category A or TPL-001-0 conditions (intact system) in 2026.

Following are the results of the 2026 steady state contingency analysis (NERC Category B or TPL-002-0 conditions) performed on Zone 5.

Contingency results were similar to those seen in 2021. The only new finding is the marginal voltage at Pennsylvania in for the outage of Oak Creek – Pennsylvania 138-kV line. The Pennsylvania 138-kV bus does not drop below 90 percent under contingency, so no mitigation is needed in this timeframe. ATC Planning Criteria calls for maintaining bus voltages at 90 percent or higher under intact system conditions.

Past 10-Year Assessments found thermal overload issues under single contingency conditions for the existing Oak Creek – Pennsylvania 138-kV line. This issue did not appear in the 2011 10-Year Assessment. The past solution was to uprate the Oak Creek – Pennsylvania 138-kV line in 2021. This provisional project in-service date was retained for now until it can be determined in future Assessments that these thermal issues truly no longer exist.

In the 2021 results section, a potential Rockdale–Mill Road 345-kV line was discussed as a way to improve bus voltages in Waukesha, Washington, and Jefferson Counties. Through 2019, our planning models indicate there is generation available that could provide support to the three county region. At some point between 2019 and 2024, all of the available



generation will be dispatched. Dispatching local generation has been able to provide voltage and thermal relief. When all the generation has been dispatched, no additional relief will be available and it will be time to consider other system improvements.

A Rockdale – Mill Road 345-kV line could consist of the following components:

- Construct a new 345/138-kV Mill Road Substation (formerly known as Lannon Junction) at the intersection of the Cypress-Arcadian 345-kV line, the Arcadian-Granville 345-kV line, Germantown-Bark River 138-kV line and Sussex-Tamarack 138-kV line. This project will improve the 138-kV voltage profile in the area and facilitate expansion of the 345-kV network to the west of this substation. A 500 MVA, 345/138-kV transformer will be installed.
- Construct a Rockdale-Concord 345-kV line adjacent to the existing Rockdale-Jefferson-Concord 138-kV line on existing double-width right-of-way and install a 500 MVA, 345/138-kV transformer at Concord.
- Convert the Bark River-Mill Road 138-kV line (currently built to 345-kV standards) to 345-kV operation and install a 500 MVA, 345/138-kV transformer at Bark River.
- Construct a new 345-kV line from Concord to Bark River.

No performance limits were exceeded for Category A conditions for all 2026 analysis.

Assessment of Steady State Compliance with NERC Standards

The mitigation plans comprised of planned, proposed and provisional projects identified for Zone 5 in this Assessment will allow the ATC system in Zone 5 to meet the steady state portions of NERC standards TPL-001 and TPL-002 in each of the five years 2012-2016, and for the 2016-2021 planning horizon.