



## **Zone 4 – 2026 study results**

Refer to Table ZS-4 and Figure ZS-16

### *Summary of key findings*

- Zone 4 is an active study area for potential wind generation additions,
- Additional reinforcements may be needed in the Kewaunee, Manitowoc and eastern Calumet County areas due to potential increases in generation, and
- The load forecasts have resulted in the deferral or absence of system performance issues identified in prior 10-Year Assessments.

A project for replacing the two existing Glenview 138/69-kV transformers in past Assessments has been delayed from 2020 and is now scheduled for 2025. It would address the potential overload of the transformers under single contingency conditions. The transformer overloads are primarily due to the potential for higher load demand of a local industrial customer. This project may be able to be deferred several additional years by transferring load from the Glenview 69-kV bus to the 138-kV buses, depending upon the customer's load cycle.

A provisional project to address the potential overload of the two existing Sunset Point 138/69-kV transformers has a current in-service date of 2024. The prior in-service date was driven by potential economic benefits to replacing the transformers, but updated economic benefits screening has shown that the project cost is now likely to exceed the projects economic benefits.

The Manrap – Custer 69-kV circuit continues to overload and the magnitude of the overload continues to increase in the 2026 summer peak models. A provisional project for a new Shoto – Custer 138-kV line could help address this overload as well as the potential heavy flows on the Shoto – Mirro – Northeast – Revere 69-kV line or the Shoto 138/69-kV transformer. These loading issues occur under single contingency conditions during non-peak periods with certain generation patterns. The project includes constructing a new Shoto – Custer 138-kV line and installing a new 138/69-kV transformer at Custer Substation. This project is currently scheduled for a 2022 in-service date based upon updated load and generation assumptions utilized in the studies. The in-service date as well as the scope of the project may need to be adjusted once a more detailed study is completed.

A new limitation to the 2026 analysis is the Glenview – Gravesville 69-kV circuit overloads for various contingencies. The ratings of this circuit were reduced in 2010 as a result of a Line Rating Study conducted by ATC. The result of this study was to develop a small Asset Renewal project to increase the conductor clearances to restore circuit ratings to an



acceptable level. This project was completed in April 2011, thus the limitation can now be considered addressed.

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

Prior assessments have shown the need for potential transmission reinforcements in the Sheboygan, Kewaunee, and Green Bay areas. Although system needs in the 2026 timeframe have diminished with the load forecasts used in the 2011 10-Year Assessment, it is desirable to keep the discussion below in mind in case the system needs re-emerge in the next Assessment. The reinforcements listed below are based upon preliminary analysis to address system issues under single-contingency conditions. Further adjustments will be made to reflect system needs as well as in-service dates in future 10-Year Assessments.

Potential future reinforcements are:

- Upgrading the Edgewater – Washington Ave. 69-kV line may be needed in the timeframe just beyond 2026 to address line overloads under single-contingency conditions,
- Additional transmission reinforcements such as adding a second 138/69-kV transformer at the East Krok Substation may be needed in the timeframe beyond the current planning horizon to boost voltages along the East Krok – Beardsley Street – Barnett 69-kV line under single-contingency conditions, and
- Depending on the load forecasted in downtown Green Bay, additional transmission reinforcements such as rebuilding the older sections of the existing Oak Street – Ashland 69-kV line may be needed in the timeframe beyond the current planning horizon to address line overloads under single-contingency conditions.
- Increasing the rating of the Kewaunee – East Krok 138-kV line may be needed to address line overloads under certain transmission outages and generation patterns,

### ***Assessment of Steady State Compliance with NERC Standards***

The mitigation plans comprised of planned, proposed and provisional projects identified for Zone 4 in this Assessment will allow the ATC system in Zone 4 to meet the steady state portions of NERC standards TPL-001 and TPL-002 in each of the five years 2011-2015, and for the 2016-2020 planning horizon.