



## **Zone 5 – 2016 study results**

Refer to [Table ZS-2](#) and [Figure ZS-18](#)

### *Summary of key findings*

- Potential thermal limitations indicate the need for facility upgrades in the Waukesha area,
- Distribution load serving issues will be addressed by the construction of the Milwaukee County interconnection project,
- There are likely to be impacts related to the road interchange reconstruction project near the Milwaukee County Zoo that will generate transmission system projects in the next few years, and
- Load serving issues in Kenosha County and along the ATC/Commonwealth Edison interface will be resolved with a 345-kV line between Pleasant Prairie and Zion Energy Center.

In response to a customer request for a new distribution interconnection, two radial 138-kV transmission lines will be placed in service in 2015 to serve the new Milwaukee County Substation.

Studies are ongoing to determine potential transmission system impacts related to the expansion of the road interchange near the Milwaukee County Zoo. ATC is meeting with the Department of Transportation and We Energies to determine impacts and coordination issues related to those impacts. The current plan for expansion of the interchange area is as follows:

- Expand/update Watertown Plank area (2013),
- Expand/update Highway 100/Highway 45 area (2014), and
- Expand/update remainder of freeway (2015-2018).

Preliminary results indicate that as a result of this road relocation project, the transmission system around the Zoo Interchange could require reconfiguration in the 2013 timeframe. If there are additional transmission impacts as a result of this road expansion, projects will be developed as needed and reported in future Assessments.

Following are the results of the 2016 contingency analysis (NERC Category B or TPL-002-0 conditions) performed on Zone 5.



Circuit breaker outages at Pleasant Prairie continue to cause the transformer at Bain to exceed its summer emergency rating. Temporary load relief can be achieved by backing down local generation. The proposed 345-kV bus reconfiguration at Pleasant Prairie in 2013 will resolve the issue at that substation.

Circuit breaker outages at Oak Creek continue to cause the transformer at Oak Creek to exceed its summer emergency rating. In the 2016 90% E-W bias case, a Granville 345-kV bus outage causes thermal overloads on the 345/138-kV transformer. Thermal relief in these areas can be achieved by backing down local generation.

As was discussed in the 2012 results discussion, an outage of either Arcadian – Waukesha 138-kV line continues to create thermal overload issues in the area. A project to rebuild the Arcadian – Waukesha 138-kV lines will address these issues and is proposed for 2016.

An outage of the Arcadian 345/138-kV transformer #1 causes the other area transformer to approach its summer emergency rating. Project development is underway to replace the existing Arcadian transformers with one or two 500 MVA transformers. Other alternatives are also being considered. Re-dispatching local generation will provide interim relief.

Past 10-Year Assessment found low voltages issues under contingency conditions in the Oak Creek/Bluemound area. Those issues did not appear in the 2011 10-Year Assessment. The previous solution was to install three 75 MVAR capacitor banks at the Bluemound Substation in 2014. This provisional project was retained and delayed one year to 2015 until it can be determined in future 10-Year Assessments that these voltage issues truly no longer exist.

The Bain – Kenosha, Kenosha – Lakeview, and Lakeview – Zion 138-kV lines exceed their summer emergency ratings for certain outages. In addition, the Pleasant Prairie – Zion 345-kV line approaches its summer emergency rating for certain outages. A project to construct a six mile, 345-kV line between Pleasant Prairie and the Zion Energy Center scheduled for 2014 will address these issues. For more information, please refer to Economics.

The Albers – Kenosha 138-kV line exceeds its summer emergency rating for certain outages. Further study is needed to determine the best solution to this issue. Temporary loading relief can be achieved by re-dispatching area generation.

The Harbor – Kansas and Oak Creek – Ramsey 138-kV lines overload under contingency in off-peak scenarios. Further study is needed to determine the best solution to these issues. Temporary loading relief can be achieved by backing down local generation.

No performance limits were exceeded for Category A conditions for all 2016 analysis.



# 10-Year Assessment

An annual report summarizing proposed additions and expansions to ensure electric system reliability.

# 2011

**September 2011 10-Year Assessment**  
**[www.atc10yearplan.com](http://www.atc10yearplan.com)**

The lead times necessary to implement the corrective plans that are scheduled for 2012 through 2016 were considered and taken into account prior to assigning an in-service date for each associated project. All of the projects scheduled for the near term planning horizon have an “In-service date” that matches the “Need date”, except the following projects:

*Projects whose “Need date” precedes the “In-service date”*

- None

*Projects whose “In-service date” precedes the “Need date”*

- Bluemound capacitor banks as described above.