



Zone 1 - 2010 study results

Refer to [Table ZS-1](#) and [Figure ZS-1](#)

Summary of key findings

- The Rhinelander Loop will require completion of the proposed interconnection to other portions of the system in order to reliably serve load in the 2010 and beyond timeframe.
- Continued low voltages and overloads on the transmission facilities around the Tomah area. The 69-kV transmission corridor in the central part of Monroe County is particularly sensitive to a west-to-east system bias. Thus, this area will require reinforcements be implemented to reliably serve load in the future.

Several potential reinforcements have been evaluated to address the low voltage and thermal overload issues in the Tomah area. Furthermore, there is a need for periodic separation of the ATC-Dairyland Power Cooperative facilities at the Council Creek Substation. We worked in cooperation with Dairyland Power Cooperative and Xcel Energy to develop a more comprehensive long-term solution to address reliability issues in the Tomah area as well as the limitations along the Monroe County-Council Creek transmission corridor. The proposed solution will be to replace the existing 69-kV circuit between the Monroe County and Council Creek Substations with a new 161/69-kV double-circuit line in 2013.

The portion of the transmission system referred to as the Rhinelander Loop consists of the 115-kV facilities in north central Wisconsin or, more specifically, the 115-kV network north of Wausau. The Rhinelander Loop is particularly sensitive to low voltage during certain contingencies. A primary reason for this condition is that summer loads within the Rhinelander Loop have exceeded what had been forecasted prior to ATC's formation. This higher-than-anticipated load growth has accelerated the potential for such low voltages under single contingency conditions.

As part of the analyses of potential solutions for the Rhinelander Loop, we considered additional system issues that needed to be addressed on the adjacent 69-kV network to the north of the Rhinelander Loop (in Zone 2) and transfer capability needs between Wisconsin and Michigan's Upper Peninsula.

Based on the prior analyses, ATC's preferred longer-term solution is to construct a new Cranberry-Conover 115-kV line and rebuild the Conover-Iron River-Plains 69-kV line and convert to 138-kV operation. This alternative addresses the longer-term reliability issues of the Rhinelander Loop, provides substantial voltage support to the 69-kV system in the western portion of the Upper Peninsula and addresses potential long-term condition issues due to the age of the existing 69-kV system. The new 115-kV line between Cranberry and Conover was completed in June 2008, with the remainder of the project to be completed by June 2010 to meet reliability needs for serving the Rhinelander Loop. The 2010 date for the Conover-Plains portion of the project is only permissible by implementing some interim procedures and solutions. Without the Conover-Plains portion of this solution, overloads and voltage issues begin to reappear in the Wausau/Rhinelander Loop area in this timeframe.



10-Year Assessment

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

2009

October 2009 10-Year Assessment
www.atc10yearplan.com

To address low voltages elsewhere in Zone 1 and Zone 3, capacitor bank upgrades were installed at the Kilbourn Substation in 2009. To address facility overloads, the Metomen 69-kV breaker will be replaced in 2010, and the existing 47 MVA Metomen 138/69-kV transformer will be replaced with a 100 MVA transformer in 2017. Overloads on the Arpin 345/138-kV transformer and Arpin-Sigel 138-kV line are being addressed by the Port Edwards Special Protection System. The low voltages at the Council Creek 138-kV Substation are being addressed through manual control of load tap changers on the Council Creek 138/69-kV transformer.

In response to customer requests for a new distribution interconnection, a new 69-kV transmission line for the Warrens Substation (formerly known as Mill Creek) will be placed in-service in 2010 by interconnecting to the Council Creek-Tunnel City 69-kV line. In 2012, a new 115-kV transmission line is needed from Clear Lake to the new Arnett Road distribution interconnection. The proposed Fairwater Substation distribution interconnection in the greater Ripon area will require a new radial 69-kV line be extended from the Brandon 69-kV Substation in 2010.

To improve reliability, ensure safety and compliance with current code requirements, a maintenance-driven rebuild of the Arpin-Rocky Run 345-kV circuit is proposed. Subsequent to an extensive study, our Asset Management organization concluded that the Arpin-Rocky Run 345-kV transmission line is structurally deficient and is capacity limited due to insufficient conductor-to-ground clearances. ATC received regulatory approval for this project in 2009 and anticipates that the completion date for the rebuild will be 2010.

Projects whose "Need date" precedes the "In-service date"

None

Projects whose "In-service date" precedes the "Need date"

None