



Zone 2 - 2016 study results

Refer to [Table ZS-2](#) and [Figure ZS-6](#)

Summary of key findings

- Maintaining reliability of service to load in and around the greater Escanaba area requires that system reinforcements be implemented in the near term, and
- Projects driven solely by the potential for the Kinross load addition in the eastern U.P. have been removed from the project list.

Escanaba area

As part of the [ATC Energy Collaborative – Michigan](#), several projects were identified to address system issues in the Escanaba area by 2016.

- Construct Chander-18th Road double-circuit 138-kV lines (2014), and
- Install Arnold 345/138-kV transformer (2015)

These Escanaba area projects were identified as a result of the analyses of several potential futures, which indicated low voltages and overloaded facilities throughout the 69-kV system in central Delta County. These projects also address many System Operations and Asset Renewal limitations. There are numerous System Operations needs associated with the Escanaba area driven by outage coordination issues that make maintenance work very difficult and/or expensive to perform. In addition, there are local issues associated with the lack of generation availability and/or possible network transmission service additions.

Eastern U.P.

A new transmission-distribution interconnection, referred to as the Kinross load, was proposed as a load addition in Chippewa County south of Sault Ste. Marie. This load originally represented a significant addition to the existing load in the Sault Ste. Marie area, and created a sudden change in the load, generation, and transmission balance in the eastern U.P. Since the 2010 Assessment the net load proposed for this project has been greatly reduced to the point of not needing projects driven solely by the original load addition. The following projects are now needed without the large Kinross load.

- Rebuild Straits-Pine River lines 6904/5 for 138 kV and operate at 69 kV (2014), and
- Uprate Pine River-Nine Mile 69-kV line 6923 to 167 degrees F and minimum asset renewal (2016).



These projects will be required to improve the voltage profile and eliminate thermal limitations in the eastern U.P. during this timeframe.

In order to eliminate power flow limitations in the eastern U.P., ATC is proposing the addition of flow control technology in the area. The project chosen to address these issues is the installation of a back-to-back HVDC device with voltage source converter technology (VSC). The VSC will be connected in series with the Straits-McGulpin 138-kV lines (9901/9903) for installation as soon as possible around the year 2014.

Power flow control in the eastern U.P. will adjust flows to more manageable levels to preserve system reliability during maintenance and construction activities in the Upper and Lower Peninsula systems through a large variety of system conditions, as well as providing improved local area power quality. It could also reduce system losses and allow more economic dispatch of market generation if used to eliminate congestion while maintaining local area reliability. Further study is required to determine the appropriate operational protocol using this new device.

In conjunction with the eastern U.P. power flow control, ATC expects to permanently energize a Hiawatha-Indian Lake line at 138 kV as soon as the VSC flow control is in service. The Hiawatha-Indian Lake 138-kV project will increase the effectiveness of the flow control project. It will enhance reliability by relieving voltage limitations and providing more reliable maintenance outage opportunities.

Munising/Newberry area

As part of the ATC Energy Collaborative – Michigan, an uprate of the Munising-Blanney Park 69-kV line was identified to address network system, asset renewal, and System Operations issues in 2014.

Western area

Project development following the ATC Energy Collaborative – Michigan, determined that a rebuild of the Atlantic69 line should be scheduled for completion in the 2013 timeframe. This project will address low voltages, overloaded facilities and facility condition throughout the Western area.

Several other projects were identified as near term solutions for the U.P. The solutions for the eastern U.P., Munising/Newberry and Escanaba areas for the years 2012-2016 are outlined in the Zone 2 – 2012 study results section.

No performance limits were exceeded for Category A conditions for all 2016 analysis except the high voltage at Munising, Alger, and Alger-Delta 138-kV buses and the Lakota Road 115-kV bus in the 2016 70% load model. The high voltage issues can be addressed by adjusting generation in the area.



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

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"

- None